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First three Navy nuke attack submarines to be 95% Made in India

The Cabinet Committee on Security is considering the Navy proposal worth over Rs 50,000 crore for indigenously building three nuclear attack submarines which would be built by the Defence Research and Development Organisation (DRDO) in Visakhapatnam

By Manjeet Negi

In a major boost to the government's bid to indigenise the defence sector, the first three nuclear attack submarines planned to be built by the Indian Navy would be 95 per cent made in India.

The Cabinet Committee on Security is considering the Navy proposal worth over Rs 50,000 crore for indigenously building three nuclear attack submarines which would be built by the Defence Research and Development Organisation (DRDO) in Visakhapatnam. In a separate project, Arihant class nuclear-powered submarines are being built with the capability of launching ballistic missiles.

“The nuclear attack submarine project would be a big boost for the indigenous submarine capability as 95 per cent of it would be made in India. This would provide a big boost to the domestic defence sector including both private and public sector,” a top government source told India Today TV.

The project would also be very helpful for the economy as it is expected to generate a large number of jobs in the defence sector, sources said. The Navy and DRDO would first get a clearance for three of these boats and will have the option of building three more after the completion of this project.

The Indian Navy proposal to have six indigenous nuclear attack submarines was one of the first few major defence modernisation proposals to have been cleared by the Narendra Modi government soon after it came to power in 2014.

Despite some delays, India has been making big headways in the field of indigenous submarine building capability. The first Arihant class boat was commissioned a few years ago and the second one INS Arighat is also undergoing sea trials and is expected to be commissioned in near future.

India has plans to build 24 submarines, including six with nuclear attack capabilities, which would give it long legs to operate in the Indian Ocean region and will help it to keep its adversaries in check at long distances.



The Indian Navy proposal to have six indigenous nuclear attack submarines was one of the first few major defence modernisation proposals to have been cleared by the Narendra Modi government soon after it came to power in 2014. (File photo/Representationa

The first six conventional boats are already under construction in Mumbai under the Kalavati class project while the tender for the next six with greater capability would be issued soon after recent clearance by the Defence Ministry. There is a plan to build six more conventional submarines under Project 76 but it will take a long time to be initiated.

India is also leasing nuclear attack submarines since the 1990s which have helped it remain current on the operations of such boats.

<https://www.indiatoday.in/india/story/first-three-navy-nuke-attack-submarines-95-made-in-india-1814295-2021-06-13>



Mon, 14 June 2021

नौसेना के लिए पनडुब्बी बनाएगा DRDO, परमाणु क्षमता के साथ होगी मेड इन इंडिया

Defence Ministry ने लगभग 43,000 करोड़ रुपये की लागत से भारतीय नौसेना के लिए छह अत्याधुनिक पनडुब्बियों के निर्माण को मंजूरी दी है।

नई दिल्ली: देश में पनडुब्बी निर्माण की क्षमता को बढ़ावा देने के लिए परमाणु क्षमता से लैस तीन पनडुब्बियों का निर्माण भारत में किया जाएगा और इनके निर्माण में 95 फीसदी मेड इन इंडिया उत्पादों का प्रयोग किया जाएगा। इसी तरह अन्य पनडुब्बियों का निर्माण भी भारत में किया जाएगा। रक्षा मामलों पर कैबिनेट कमिटी इसके लिए 50 हजार करोड़ के प्रस्ताव पर विचार कर रही है, जिनका निर्माण विशाखापत्तनम में डीआरडीओ द्वारा किया जाएगा। ये प्रोजेक्ट अरिहंत क्लास की परमाणु क्षमता से लैस 6 पनडुब्बियों के निर्माण से अलग होगा। अरिहंत क्लास की पनडुब्बियों के पास बैलिस्टिक मिसाइल लॉन्च करने की क्षमता भी होगी।

सरकारी सूत्रों ने ANI से कहा कि परमाणु क्षमता से लैस पनडुब्बी प्रोजेक्ट से स्वदेशी तकनीक क्षमता को बढ़ावा मिलेगा, क्योंकि ये पनडुब्बियां 95 फीसदी भारत निर्मित होंगी। इससे डिफेंस सेक्टर को भी काफी फायदा मिलेगा, चाहे वह प्राइवेट हो या सरकारी। उन्होंने कहा कि परमाणु क्षमता से लैस पनडुब्बियों के निर्माण को डेडलाइन पर पूरा कर लिया जाएगा और अगर किसी तरह की समस्या आती है, तो इसमें भारत अपने रणनीतिक सहयोगी की मदद लेगा। सूत्रों ने कहा कि इस प्रोजेक्ट से अर्थव्यवस्था को काफी फायदा होगा, क्योंकि डिफेंस सेक्टर में काफी नौकरियां पैदा होंगी।



भारत की योजना 24 पनडुब्बियों के निर्माण की है, जिनमें से 6 परमाणु क्षमता से लैस होगी. ANI

नौसेना और डीआरडीओ को पहली तीन पनडुब्बियों के निर्माण के लिए क्लियरेंस मिल गई है और इनका निर्माण पूरा होने के बाद बाकी तीन अन्य का भी निर्माण किया जाएगा। बता दें कि 2014 में केंद्र की सत्ता में आने के बाद मोदी सरकार ने रक्षा आधुनिकीकरण के लिए जिन प्रस्तावों का ऐलान किया था, ये उनमें से एक है। भारत की योजना 24 पनडुब्बियों के निर्माण की है, जिनमें से 6 परमाणु क्षमता से लैस होगी।

इन पनडुब्बियों के सक्रिय हो जाने के बाद हिंद महासागर में भारत को अपने दुश्मनों पर निगाह रखने में काफी आसानी होगी। पहली 6 कन्वेंशनल पनडुब्बियों का निर्माण मुंबई में कलावती क्लास प्रोजेक्ट के तहत चल रहा है, अगली 6 पनडुब्बियां ज्यादा क्षमता से लैस होंगी और जल्द ही इन काम शुरू होगा। हाल ही में भारतीय नौसेना के लिए छह अत्याधुनिक पनडुब्बियों के निर्माण की परियोजना को रक्षा मंत्री राजनाथ सिंह की अध्यक्षता में रक्षा अधिग्रहण परिषद ने अनुमति दी है। साथ ही निर्माण के वास्ते प्रस्ताव का अनुरोध (रिक्वेस्ट फॉर प्रोजेक्ट) शीघ्र जारी किया जाएगा। मंत्रालय ने लगभग 43,000 करोड़ रुपये की लागत से भारतीय नौसेना के लिए छह अत्याधुनिक पनडुब्बियों के निर्माण को मंजूरी दी है।

पनडुब्बी 'आईएनएस चक्र' रूस लौटी

भारतीय नौसेना की परमाणु हमला करने में सक्षम एकमात्र पनडुब्बी 'आईएनएस चक्र' रूस लौट गयी है। इस पनडुब्बी को रूस से पट्टे पर लिया गया था। अकुला श्रेणी के पोत आईएनएस चक्र को 2012 में पट्टे पर रूस से लिया गया था। परमाणु क्षमता से लैस यह दूसरी पनडुब्बी थी जिसे भारत ने रूस से पट्टे पर लिया था। सूत्रों ने बताया कि पट्टे की अवधि खत्म होने का समय आ जाने के कारण यह पनडुब्बी रूस वापस जा रही है।

परमाणु क्षमता से संपन्न पहली पनडुब्बी का नाम भी चक्र था। यह पनडुब्बी तत्कालीन सोवियत संघ से 1988 में तीन साल के पट्टे पर ली गयी थी। 'आईएनएस चक्र' के रूस वापस जाने की कुछ तस्वीरें सोशल मीडिया पर आयी हैं। हालांकि इस मामले पर आधिकारिक तौर पर कुछ नहीं बताया गया है। भारत ने 2019 में 10 साल के लिए भारतीय नौसेना को परमाणु क्षमता से लैस पनडुब्बी के लिए रूस के साथ तीन अरब डॉलर का समझौता किया था। इस समझौते के तहत रूस 2025 तक भारतीय नौसेना को अकुला श्रेणी की पनडुब्बी चक्र-तीन सौंपेगा।

<https://hindi.news18.com/news/nation/first-three-indigenous-nuclear-attack-submarines-to-be-95-pc-made-in-india-3620309.html>

As India awaits S-400 Missiles, How potent are its current Air Defense Systems against Chinese Jets?

By Apoorva Jain

Ahead of the delivery of the first batch of S-400 missile defense systems from Russia, it might be interesting to look at India's existing air defense missiles and how potent they would be in thwarting threats from China.

Recently, the Chinese Air Force (PLAAF) carried out massive air drills from its airbases opposite Eastern Ladakh. Around 21-22 PLAAF jets held an exercise opposite the Indian territory in Eastern Ladakh, a development that would have alarmed Indian officials.

India started developing its air defense systems in 1999, a year after both India and Pakistan conducted nuclear tests, and then the two neighbors fought a war at Kargil.

India's two-tier Ballistic Missile Defence (BCMD) system includes the Prithvi Air Defence (PAD) and the Advanced Air Defence (AAD) for high (50-80 km) and low-altitude interceptions (15-30km), respectively.

There are also early-warning and tracking radars to complement this system.

Developed in two phases, Phase I focuses on defending against incoming missiles from within the Earth's atmosphere (endo-atmospheric) while Phase II deals with beyond Earth's atmosphere (exo-atmospheric).

India's Ballistic Missile Defense

The development and testing for stage-I of BMD were completed in 2012. It has been speculated that India's national capital, New Delhi, would get a defense shield. After completion of stage-II, the two-tier system will be capable of intercepting ballistic missiles from a range of 5,000 kilometers.

The first PAD missile was first successfully tested in 2006 for defense against ballistic missiles. There is a two-stage development process that relies on liquid fuel in the first stage and solid fuel in the second stage.

Similarly, the first AAD was tested in 2007 and the latest interceptor was test-fired in 2018 under the Prithvi Defence Vehicle (PDV) mission that is being mooted to replace AAD in near future.

Akash — The Anti-Cruise Missile System

India is also actively working to develop an anti-cruise missile system capable of defending against attacks by cruise missiles. The Akash missile system developed by the DRDO is a medium-range surface-to-air missile (SAM) capable of targeting fighter jets, cruise missiles and ballistic missiles.

Since 1990, when the first test flight of Akash was conducted, several modifications and upgrades have been made in it to make it suitable for deployment in the high mountainous terrain.

The DRDO successfully tested the latest model of Akash, called 'Akash-NG' in January this year with additions like improved reaction time and higher-level of protection against saturation attacks.



[Akash Missile – Wikipedia](#)

An expert speaking to EurAsian Times earlier noted the versatility of Akash as its biggest advantage over other systems.

According to media reports, the Indian Air Force has deployed Akash at the Tezpur station in Assam, which is located 172 km from the China border.

As reported by EurAsian Times, India and Israel are jointly developing a “medium-range Barak missile system” which is capable of destroying multiple airborne targets including ballistic and cruise missiles, drones, helicopters, and combat jets.

Homegrown Missiles

According to reports, close to 63% of the military’s budget for 2021-22 is set aside for buying locally produced weapons and systems to boost defense indigenization.

On May 31st, the Indian Defence Ministry notified a second negative import list containing 108 defense items that cannot be imported.

Calling it ‘Positive Indigenization List’, it contains items such as light helicopters, anti-material rifles, next-generation Corvettes among others. The first such list came out last year in August containing 101 items.

“It is a positive list on the strength of which our own manufacturing capacity is going to increase. This is a positive list that will create jobs in India; This is a positive list as it guarantees that products made in India will be sold in India,” Prime Minister Modi had said earlier this year.

Among the indigenous weapons tested last year, the naval version of the BrahMos supersonic cruise missile, jointly developed by India and Russia and India’s first anti-radiation missile Rudram-I caught the attention of defense enthusiasts.

Another notable mention is the new version of the nuclear-capable Shaurya missile, test-fired off the coast of Odisha.

Between 2021 and 2023, the DRDO is going to overhaul the domestic weapon systems including beyond visual range (BVR) missiles, Rudram-I and the anti-tank missiles Nag.

Specifying the timelines for delivery of each item, the Astra BVR missile is expected to be delivered this year while quick reaction surface to air missile system (QRSAM) along with anti-tank missiles called ‘Nag’ and ‘Helina’ (helicopter-based Nag missile) will be inducted next year, as reported by Hindustan Times. Rudram will be ready by 2023.

DRDO also reached a milestone by successfully test-firing the Hypersonic Technology Demonstrator Vehicle (HSTDV), joining the elite hypersonic club, as reported by Eurasian Times.

Awaiting the Russian S-400

The state-of-the-art S-400 Triumph air defense system consists of long-range surface-to-air missiles (SAM) with varying 40km-400 km range. It is capable of intercepting missiles as well as aircraft.

Despite reservations from the US, India requested to expedite the delivery of the missiles in view of the ongoing standoff with China and the Russians assured India of timely delivery by 2021 year-end, as Eurasian Times reported.

The US has been opposing the acquisition of S-400 by its allies fearing that the Russian weapon system would endanger the security of US military technology and personnel. Washington has already imposed sanctions on Turkey, a NATO ally, for buying the S-400 from Russia despite repeated warnings.

China has also imported the same set of S-400 missiles and received its first batch back in 2018. In the same year, India inked the \$ 5.43-billion deal with Russia during the 19th India-Russia Annual Bilateral Summit in New Delhi.

Amid the ongoing standoff with China, India’s indigenous BDM missiles along with S-400 will provide the necessary defense against any unprecedented Chinese aggression.

<https://eurasianimes.com/as-india-awaits-s-400-missiles-how-potent-are-its-current-air-defense-systems-against-chinese-jets/>

How the BrahMos missile has evolved since it was test fired for the first time on this day 20 years ago

Snapshot

- *Twenty years after it was first tested, the BrahMos cruise missile has evolved into a reliable weapon, a critical component of India's offensive firepower.*

On 12 June 2001, a relatively unknown missile, jointly developed by India and Russia, blasted off from its canister at the Integrated Test Range of the Defence Research and Development Organisation in Orissa's Chandipur and roared majestically into a clear sky breathing out orange plume and leaving behind a cloud of smoke. It was, perhaps, the first time that the defence minister and all the service chiefs were present to witness the test launch of a missile.

Twenty years later, this missile — BrahMos — has evolved, as its makers say, into a '*brahmastra*', becoming a critical component of the offensive firepower of the Indian Army and the Indian Navy. The Indian Air Force is close to inducting its air-launched version, and the missile may even find a foreign buyer soon.

On Land

The Block-I of land-based version of the BrahMos was tested in the mid-2000s. By June 2007, the Indian Army had inducted the first missiles into its arsenal.

According to BrahMos Aerospace, one land-based weapon complex of the cruise missile has four to six mobile launchers, a mobile command post and a mobile replenishment vehicle. Each autonomous launcher has three canisters.

"The missiles can be fired in single or salvo of 2 to 3 seconds within four minutes of receiving command," the maker of the missile says.

As Block-I version of the missile did not have the desired precision, owing to its inferior seeker, a new version of the missile — Block-II — was developed. This version, which has a more precise guidance system, was first test-fired in 2008.

In 2010, a new version of the missile, based on the army's need for precision targeting in mountainous terrain, where targets are often located behind natural barriers, was tested for the first time. The changes required for this in the missile's guidance software were incorporated in Block-III of the missile.

This version of the missile is capable of steep diving into valleys after flying over ridge lines, making it suitable for use along India's mountainous border.

By 2016, this version of the BrahMos missile was tested for 65-degree steep dive. In 2019, it was tested for vertical steep dive.

India reportedly has three regiments of the BrahMos with Block-I and II missiles. In 2018, the government gave a go-ahead for the induction and deployment of a fourth regiment of the BrahMos in Arunachal Pradesh. This regiment of BrahMos will be equipped with the steep dive version of the missile.



BrahMos supersonic cruise missile.



The BrahMos missile being test fired from INS Chennai.

At Sea

The Indian Navy was the first to identify the potential of the BrahMos missile. In 2003, destroyer INS Rajput was fitted with four missiles, two on each side in inclined configuration. It was inducted by the navy in 2005.

The navy uses both anti-ship and land-attack versions of the missile. The land-attack version was test-fired for the first time by the navy from INS Rajput in 2008, giving it the capability of hitting coastal installations of the enemy.

Apart from some Rajput-class destroyers, the navy uses BrahMos cruise missiles on Talwar-class, Shivalik-class, and Nilgiri-class frigates, Kolkata-class and Visakhapatnam-class destroyers for both anti-ship and land-attack roles.

The navy has demonstrated the capability to fire the missile in salvo mode, “in which warships carrying the BrahMos can fire eight missiles at an enemy flotilla, two seconds apart, each targeting a different enemy warship”.

BrahMos Aerospace has also developed a submarine-launched variant of the missile, which was test-fired for the first time in 2013. The submarine-launched version, the maker says, can be launched from a depth of 40 to 50 metres.

In December 2020, reports said the Indian Navy will buy 38 extended range BrahMos supersonic cruise missiles. The extended range version of the missile, which the Navy will get, is capable of hitting targets as far as 450 km away.

In Air

The Indian Air Force (IAF) test-fired the missile from a modified Su-30MKI three times — first in 2017, second in May 2019 and the third in October 2019.

The air-launched version of the missile, lighter than other versions, weighs around 2.5 tonnes. The SU-30MKI fighters of the IAF, which will carry the missile, will have to be modified. Avionics of the fighter will have to be modified and the aircraft structure strengthened.

Earlier this year, the IAF deployed No. 222 Squadron 'Tigersharks' at Air Force Station Thanjavur in Tamil Nadu. The squadron is being equipped with SU-30 MKIs capable of carrying BrahMos missiles.

BrahMos Aerospace is also developing an ‘NG’ version of the missile for the IAF. According to *Livefist*, Su-30MKIs will be capable of three BrahMos-NGs.

In March this year, Su-30MKIs armed with BrahMos missiles took part in an exercise with the US in the Indian Ocean. The exercise gave the BrahMos-armed squadron, based at Thanjavur, an opportunity to practice maritime strike.

Increased Range and Indigenisation

After India became a member of the Missile Technology Control Regime, BrahMos Aerospace started working on increasing the range of the missile.

A new version of the missile, called BrahMos-ER (extended range), was tested in 2017. In 2019, the firm said that a new missile with a range of up to 500 km is ready. Another version, with a range of 800 kilometres, is under development.

A large part of the missile has also been indigenised. By 2018, the missile had reached 65 per cent indigenisation by value from 10-12 per cent in early years.

“In another six months, we would be close to 75 per cent,” BrahMos Aerospace managing director and CEO Sudhir Mishra said in May 2018.

In March 2018, BrahMos was tested with an indigenous seeker developed by BrahMos Aerospace in partnership with the Defence Research and Development Laboratory and made by Electronic Corporation of India Limited. Two private companies were also part of the development of the indigenous seeker.

High Energy Materials Research Laboratory of the Defence Research and Development Organisation (DRDO) is developing a special solid propellant to be used as fuel by BrahMos.

Work on the programme was started in view of Russia's reluctance to share the technology for solid propellants with India.

The indigenous seeker being developed for BrahMos is likely to be ready within a year, the chief executive officer and managing director of BrahMos Aerospace, Sudhir Mishra, had said in an interview with *Livefist* recently.

The missile has been tested with an India seeker, Mishra had said, adding that the indigenous effort has already been successful to a "great extent".

"We have conducted two tests, one on land and the other one to target a ship, and we have been successful to a great extent," Mishra said.

"I feel it shouldn't take us more than six months or eight months to come up with a production prototype [of the seeker]. Then we will go for serial production," Mishra told *Livefist* in an interview on the blog's YouTube channel yesterday.

"Maybe within a year, we will be able to deliver the production version of the seeker," he said, adding that the seeker BrahMos Aerospace is currently working on is a radio frequency (RF) seeker. The agency will also be able to deliver an imaging seeker for the missile in another two years, Mishra added.

The BrahMos Aerospace CEO also confirmed that work on extending the range of the missile is under way, adding that the range and capability of the existing inventory can also be improved without much effort.

"In the existing inventory, we can extend the range and capability without much effort," he said, adding, "To improve the range of the missile, we have to improve the propulsion power of the engine, and that we have done."

At least seven tests of various versions of the BrahMos missile were conducted between September and December last year.

The first of these tests took place on 30 September 2020. The second launch, conducted by the Navy from INS Chennai, took place on 18 October.

On 30 October, the missile was test-fired from an Indian Air Force Su-30MKI. The fourth test, conducted by the Army, took place on 24 November. The next day, on 25 November, the missile was test-fired in the Andaman and Nicobar Islands.

First Export Customer Soon

The Philippines could soon become the first export customer of the BrahMos cruise missile as New Delhi and Manila signed an agreement for the export of Indian defence equipment to the country in March 2021.

The agreement, which comes following years of negotiations, was signed by Indian Ambassador Shambu Kumaran and Philippines Defence Undersecretary Raymund Elefante at the headquarters of the Armed Forces of the Philippines.

"We are buying the BrahMos missiles," Defence Secretary of Philippines Delfin Lorenzana said, adding that the agreement signed by the two sides deals with "policies and procedures in defence procurement".

<https://swarajyamag.com/defence/how-the-brahmos-missile-has-evolved-since-it-was-test-fired-for-the-first-time-on-this-day-20-years-ago>

Russia Day 2021: BrahMos... Redefining Indian military strength and future battlefield

The BrahMos Joint Venture (JV), a unique role-model between India's Defence Research & Development Organisation (DRDO) and Russia's JSC MIC NPO Mashinostroyeniya (NPOM), has today become a shining example of Indian-Russian military and technological cooperation

At a time when India is evolving as a great power, economically as well as militarily, the country has gained immense expertise in designing and developing state-of-the-art defence systems. This accomplishment has made it enter into an elite club of powerful nations at the global stage having the capability to build their own military platforms and systems. A perfect emblem of India's growing military might is the BrahMos supersonic cruise missile system.

BrahMos supersonic cruise missile has been indomitably scaling greater heights of success since its inception in 1998. The journey of BrahMos Joint Venture started on February 12, 1998 after the landmark signing of the Inter-Governmental Agreement at Moscow, by the Government of India and Government of Russia. Since its historic maiden launch on June 12, 2001, the BrahMos supersonic cruise missile system has charted many milestones and strengthened all three services of the Indian Armed Forces.



The BrahMos Joint Venture (JV), a unique role-model between India's Defence Research & Development Organisation (DRDO) and Russia's JSC MIC NPO Mashinostroyeniya (NPOM), has today become a shining example of Indian-Russian military and technological cooperation. The supersonic cruise missile with its multi-role capability, universality and utmost lethality, has carved a distinct place for itself in the Indian Armed Forces. The weapon stands out as the only universal supersonic cruise missile system in the whole world with the capability of neutralising land or sea-based targets.

BrahMos, initially conceived and developed as an anti-ship cruise missile (ASCM) system, has evolved over the years and added many more variants — from sea-to-land, sea-to-sea, land-to-land, land-to-sea, sub-sea-to-land, sub-sea to sea and air-to-land configurations. The universal missile can be fired either from static, mobile platforms (land and sea) or fighter aircraft, in solo or salvo mode. This multiplicity makes the weapon all the more versatile in taking on the enemy anywhere, anytime.

Indian Army, which became the first land force in the world to deploy the deadly BrahMos supersonic cruise missile in 2007, has raised several regiments of the formidable weapon in different configurations the latest being the “near vertical dive” trait to strike down an enemy target from a 90-degree angle. Similarly, for many of the Navy's frontline surface ships, BrahMos has been deployed as a prime strike weapon. In its sub-sea launch configuration, the supersonic cruise missile is set to increase the Navy's underwater weapons delivery capability manifold by being armed in the future submarines. The Indian Air Force's (IAF) frontline fighter aircraft Sukhoi-30MKI, after being modified to carry 2.5 tonne missile integrated with half a ton launcher, has successfully demonstrated BrahMos missile's firing capability. The successful induction of BrahMos in all the three services has made India the first and only country in the world to complete the “supersonic cruise missile triad”.

In its pledge to the Atmanirbhar Bharat mission, BrahMos has achieved historic milestones in the flagship 'Make In India' programme. It has successfully indigenise major sub-systems such as

Airframe, solid propellant propulsion system, nose cap, canister, fuel management system and other major non-metallic airframe components taking the Indian contribution to approximately seventy percent. All launcher systems for the weapon are also being manufactured domestically. 100% of ground support equipment for the weapon complex are also being made in India.

BrahMos Aerospace also possesses a full-fledged design centre, a Missile Industrial Consortium for producing different sub-systems, a world-class integration, and check-out facilities with stringent quality control, which involves over 200 small and medium Indian public and private defence sector enterprises and institutions. BrahMos, today, employs nearly 20,000 workforce, technical and non-technical, directly and indirectly, who have been the real backbone of this successful defence programme of India.

BrahMos Aerospace now aims to take it to the next level by designing and developing even more lethal and powerful variants of the existing weapon, including a smaller, smarter BrahMos-NG (Next-Gen) for arming a wide range of modern military platforms.

The supersonic cruise missile is armed with a fine combination of speed, precision and power. The multi-platform, multi-target cruise missile, carrying a conventional warhead, is capable of flying up to 290-km at a top speed of around Mach 3. The supersonic speed with manoeuvrable trajectory makes it invincible for interception by the enemy's air defence system.

Possession of such a weapon system with a distinct capability to strike down and annihilate all types of enemy targets at different locations and in different surroundings is a major advantage. The Indian Armed Forces takes pride in being the first in the world to possess the BrahMos supersonic cruise missiles with advanced surgical-strike capabilities.

<https://www.freepressjournal.in/india/russia-day-2021-BrahMos-redefining-indian-military-strength-and-future-battlefield>

BrahMos Missile: 20 साल की हो गई 'ब्रह्मोस' मिसाइल, सिर्फ नाम सुनकर ही कांप जाते हैं दुश्मनों के दिल

BrahMos Maiden Test Flight 20th Anniversary: भारत और रूस ने मिलकर 'ब्रह्मोस' को दुनिया की सबसे तेज सुपरसोनिक क्रूज मिसाइल बना दिया है। आज से 20 साल पहले 'ब्रह्मोस' ने पहली टेस्ट उड़ान भरी थी।

By Deepak Verma

हाइलाइट्स:

- भारत और रूस की डिफेंस एजेंसियों ने साथ में बनाई 'ब्रह्मोस' मिसाइल
- पहली टेस्ट फ्लाइट को 20 साल पूरे हुए, DRDO ने 'ब्रह्मोस' को दी बधाई
- दोनों देशों के दो नदियों के नाम से मिलकर बना है इस मिसाइल का नाम
- जमीन, हवा, समुद्री जहाज या फिर पनडुबबी... कहीं से भी लॉन्च कर सकते हैं

नई दिल्ली: सबसे तेज सुपरसोनिक क्रूज मिसाइल 'ब्रह्मोस' का पूरी दुनिया में डंका बजता है। जमीन, हवा, पानी या फिर समुद्र की गहराइयों से भी दुश्मन को निशाना बना लेती है। 12 जून 2001 को मिसाइल ने अपनी पहली टेस्ट उड़ान भरी थी। इसे डिफेंस रिसर्च एंड डिवेलपमेंट ऑर्गनाइजेशन (DRDO) और रूसी एजेंसी ने मिलकर तैयार किया। DRDO ने ब्रह्मोस मिसाइल को उसकी 20वीं वर्षगांठ पर बधाई भी दी है।

ब्रह्मोस क्यों है नाम?

ब्रह्मोस का नाम दो हिस्सों- Brah और Mos से बना है। Brah यानी ब्रह्मपुत्र नदी और Mos यानी रूस की मोस्कवा नदी। यह दुनिया की सबसे तेज एंटी-शिप क्रूज मिसाइल है। इसकी अधिकतम रफ्तार 4,300 किलोमीटर प्रतिघंटा से भी ज्यादा है। यह मिसाइल बेहद पोर्टेबल है यानी इन्हें लॉन्च करना आसान है। कई नए रूपों पर भारत और रूस मिलकर काम कर रहे हैं।

BrahMos मिसाइल क्यों इतनी खास है?

ब्रह्मोस 21वीं सदी की सबसे घातक मिसाइलों में से एक है। यह मिसाइल कुछ सौ किलोमीटर से लेकर 4,000 किलोमीटर तक की रेंज में आती है। छिपे हुए निशानों को तबाह करने के लिए इसे सबसे भरोसेमंद समझा जाता है।

दो साल पहले, भारत ने ब्रह्मोस मिसाइलों को सीमा पर तैनात किया था तो पाकिस्तान की सिट्टी-पिट्टी गुम हो गई थी। पाकिस्तान के विदेश मंत्री ने संयुक्त राष्ट्र तक को चिट्ठी लिख डाली थी। इसी से अंदाजा लगाए कि दुश्मन देश 'ब्रह्मोस' मिसाइल से आखिर क्यों घबराते हैं।

<https://navbharattimes.indiatimes.com/india/drdo-brahmos-missile-20-years-of-development/articleshow/83456682.cms>



Aero India 2021: CEO बोले, आत्मनिर्भर भारत की सबसे बड़ी मिसाल है 'ब्रह्मोस', बताया- कैसे करती है काम

India's missing military industrial complex

A robust indigenous defence industry can only be developed through a strategic procurement planning agency within the ministry of defence

By Rahul Chaudhury

German general Field Marshal Erwin Rommel's remark—'The battle is fought and decided by the quartermasters long before the shooting begins'—highlights the central role of logistics and supply chains in conflict. The outcome of a war hinges on a country's industrial might and ability to quickly convert technology into engineered products. India's current strategic planning and defence acquisition suffer a lack of processes to map requirements and incorporate a realistic estimation of technology and engineering capabilities while developing a roadmap.

Arming without Aiming—the title of this 2013 book by Stephen Cohen and Sunil Dasgupta sums up the conundrum of India's defence development and procurement process. Bureaucratic lethargy and lack of focus have left us unable to leverage our skills as an IT-ES (information technology-enabled services) powerhouse. In stark contrast, China has not only deployed such equipment in its exercises, it has also realised the impact of this technology on operations. During the development of its aircraft carrier-killing missiles like the DF-21, it fielded an entirely new satellite navigation system, BeiDou. This also provides it enormous advantages in mountainous terrain. Similarly, while developing technology for cyber warfare, it put its entire domestic internet behind a firewall, making it enormously difficult to attack their digital information systems.

Clearly, the speed of development of complex systems demonstrates that the Chinese have mastered the systems engineering process. Historically, India has had a decent record too. Post Pokhran-II in 1998, Dr Kalam's DRDO (Defence Research & Development Organisation) and its private sector partners, at the height of sanctions, fielded a complete range of Prithvi and Agni strategic missiles by 2012. However, India has yet to develop a well-established domestic military-industrial complex with a tiered vendor base. Narrow prospective planning and lethargy have been the hallmark of our defence acquisition processes. This has prevented the development of a robust defence industrial base.

Take the example of the indigenous Akash surface-to-air missile system. By 2008, a public-private partnership through a committee including the DRDO, DPSU and private sector firms (Tata Power SED and L&T), along with quality assurance agencies under the ministry of defence, had certified 11,800 parts and over 3,000 vendors for these weapon systems. To keep the supply chain alive, new orders were needed, as deliveries of existing contracts were to be completed that year. However, new orders did not arrive till 2019, a decade later. Such delays kill supply chains and prevent the development of a defence ecosystem around products—if supply chains have to be created from scratch when orders are placed, when will you upskill? It has taken India 17 years to move beyond RFPs (requests for proposals) to build diesel-electric submarines. It took 19 years for orders to be placed for Tejas fighters after its first flight. A rare but much appreciated success story has been the BrahMos missile, especially the recent success of integrating it with Sukhoi aircraft, with an Indian startup executing the integration design analysis.



DRDO test fires the new Akash NG missile at the integrated test range off the coast of Odisha; (ANI Photo)

The Balkanisation of military organisation and doctrine described in Cohen and Dasgupta's book is increasingly becoming a reality. The Chief of Defence Staff, General Bipin Rawat, has been tasked with creating theatre commands to integrate the three armed forces. This could be seriously impacted by the fact that various arms—infantry artillery, armour, air defence—still lack a secure tactical communication network.

We have seen a rush of hardware purchases in recent years—S-400 missiles from Russia and Rafale jets from France. Not enough attention is being paid to China's giant strides in offensive cyber capability and its implications for India's critical infrastructure—power, railways, traffic management systems, telecom infrastructure and others. Chinese-made routers and switches are ubiquitous in many networks, with potential security implications. These need to be replaced by Indian-certified secure products to plug these vulnerabilities, before we talk of future technologies like 5G. With China now a cyber superpower on the threshold of narrow autonomous AI weapons capability, we no longer have the luxury of incompetence and ostrich-like behaviour by the military, civil and political leadership.

The dream of an Aatmanirbhar Bharat—an India self-sufficient in defence production—can only be realised through a strategic planning and procurement agency within the MoD. There is a need for a professional and permanent acquisition agency, with industry experience and access to expertise to participate in and facilitate Acceptance of Necessity (AoN, the very first stage of a defence contract) processes. What is happening now is that service HQs, with their focus on platform or product acquisition (not capability acquisition), have found AoNs cumbersome. They have now diluted this process down to just two months prior to RFPs being issued. A military platform or product life cycle is 15-30 years. No successful acquisition with field performance as desired can happen without the techno-engineering roadmap of a proper AoN. With the increasing threat of cyber warfare and narrow AI-based weapons from China, there is an urgent need to bring the private sector onboard. Sourcing and keeping supply chains healthy are a critical corporate function in any company.

Though FDI (foreign direct investment) in defence is now at 74 per cent, this has not triggered any major announcements. FDI is a consequence of market realities, not a precursor to them. To become an attractive investment destination for defence contractors, we need simple and transparent rules, competitive skills and the endorsement of the government of India collaboration. In the defence sector, most countries look at the origin of equity and vet investors; they may also require local directors and CEOs. But once approved, these companies become fully competent to address defence and homeland security market needs. In India, with the current restrictive definitions, this is not allowed.

Our goal has to be to increase real value creation in defence. For this, India needs to position its capabilities with our partner countries and benefit them with cost reduction through frugal Indian engineering. Without urgent action on these aspects, we will continue to aim without arming and arm without aiming.

(The author is former CEO, Tata Power SED, and current Chair, FICCI Homeland Security Committee)

<https://www.indiatoday.in/magazine/defence/story/20210621-india-s-missing-military-industrial-complex-rahul-chaudhury-1813373-2021-06-11>

COVID 19: DRDO's Contribution



Press Information Bureau
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Ministry of Defence

Sat, 12 June 2021 12:31PM

500-bed Covid hospital, developed by DRDO in Srinagar, becomes operational

A 500-bed COVID Hospital at Khonmoh, Srinagar has become operational. The hospital has been set-up by Defence Research and Development Organisation (DRDO) in a short span of 17 days and is funded by PM CARES Fund. This Covid facility includes 125 ICU beds with ventilators, of which 25 are exclusively reserved for children. Continuous oxygen supply is available for all 500 beds from 62 KL Liquid Medical Oxygen storage tanks. Hospital management and doctors and para-medical staff to run the facility are provided by administration of Union Territory of Jammu & Kashmir.

The hospital is centrally air conditioned with cooling provision for summers and heating capabilities during winters to maintain comfortable environment. There is a separate block for doctors & para-medical staff. Proper fire exits in case of emergency, provision of steel structure shed having inside refrigerator for mortuary and parking facility for vehicles have also been provided at the centre.

A control centre with Wi-Fi, CCTVs and helpline number has been established for proper monitoring and hospital management through modern system software. Due to cold weather, special arrangements have been made to accommodate 150 personnel including doctors, para-medical staff, pharmacy staff, security personnel and maintenance staff.

The hospital will provide medical care to Covid-19 patients of UT of Jammu & Kashmir in this time of pandemic.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1726466>



पत्र सूचना कार्यालय
भारत सरकार
रक्षा मंत्रालय

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श्रीनगर में डीआरडीओ द्वारा निर्मित 500 बिस्तरों वाला कोविड अस्पताल शुरू

श्रीनगर के खनमोह में 500 बिस्तरों वाला कोविड अस्पताल शुरू हो गया है। इस अस्पताल की स्थापना रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) द्वारा 17 दिनों की छोटी अवधि में की गई है और इसे पीएम केयर फंड द्वारा वित्त पोषित किया गया है। इस कोविड सुविधा में वेंटिलेटर के साथ 125 आईसीयू बेड शामिल हैं, जिनमें से 25 विशेष रूप से बच्चों के लिए आरक्षित हैं। 62 किलो लीटर लिक्विड मेडिकल ऑक्सीजन स्टोरेज टैंक से सभी 500 बिस्तरों के लिए लगातार ऑक्सीजन की आपूर्ति उपलब्ध है। इस सुविधा को चलाने के लिए अस्पताल प्रबंधन और डॉक्टर व पैरा मेडिकल स्टाफ केंद्र शासित प्रदेश जम्मू-कश्मीर के प्रशासन द्वारा प्रदान किया जाता है।



यह अस्पताल आरामदायक वातावरण को बनाए रखने के लिए सर्दियों के दौरान हीटिंग क्षमताओं की सुविधा तथा गर्मियों के लिए ठंडक बनाए रखने की सुविधा के साथ केंद्रीय रूप से वातानुकूलित है। डॉक्टरों और पैरा मेडिकल स्टाफ के लिए अलग ब्लॉक की व्यवस्था है। आग लगने की स्थिति में बाहर निकलने की उचित सुविधा, शवगृह के लिए स्टील स्ट्रक्चर शेड को ठंडा रखने की व्यवस्था और वाहनों के लिए पार्किंग की सुविधा भी इस केंद्र में की गई है।

आधुनिक सिस्टम सॉफ्टवेयर के माध्यम से उचित निगरानी और अस्पताल प्रबंधन के लिए वाई-फाई, सीसीटीवी और हेल्पलाइन नंबर के साथ एक नियंत्रण केंद्र स्थापित किया गया है। ठंड के मौसम में डॉक्टर,

पैरा मेडिकल स्टाफ, फार्मसी स्टाफ, सुरक्षाकर्मी और मॉटेनेंस स्टाफ सहित 150 कर्मियों को ठहराने के लिए विशेष इंतजाम किए गए हैं।

यह अस्पताल महामारी के इस समय में केंद्र शासित प्रदेश जम्मू-कश्मीर के कोविड-19 मरीजों को चिकित्सा सुविधा प्रदान करेगा।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726659>



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రక్షణ మంత్రిత్వ శాఖ

Sat, 12 June 2021 12:31PM

శ్రీనగర్ లో డిఆర్డీఓ అభివృద్ధి చేసిన 500 పడకల కోవిడ్ ఆస్పత్రిలో సేవలు ప్రారంభం

శ్రీనగర్ లోని ఖోన్మోహ్ వద్ద 500 పడకల కోవిడ్ ఆసుపత్రి పనిచేయడం ప్రారంభించింది. ఈ ఆసుపత్రిని డిఫెన్స్ రీసెర్చ్ అండ్ డెవలప్ మెంట్ ఆర్గనైజేషన్ (డిఆర్డీఓ) 17 రోజుల వ్యవధిలో ఏర్పాటు చేసింది. పిఎమ్ కేర్స్ ఫండ్ ద్వారా దీనికి నిధులు సమకూరుతాయి. ఈ కోవిడ్ సదుపాయంలో వెంటిలేటర్లతో 125 బసియు పడకలు ఉన్నాయి, వీటిలో 25 ప్రత్యేకంగా పిల్లలకు కేటాయించారు. 62 కెబిల్ లిక్విడ్ మెడికల్ ఆక్సిజన్ స్టోరేజ్ ట్యాంకుల నుండి మొత్తం 500 పడకలకు నిరంతర ఆక్సిజన్ సరఫరా అందుబాటులో ఉంది. ఆసుపత్రి నిర్వహణ, వైద్యులు, పారా మెడికల్ సిబ్బందిని జమ్మూ కశ్మీర్ కేంద్రపాలిత ప్రాంత పరిపాలన విభాగం సమకూరుస్తుంది.



ఉష్ణోగ్రతలు సమతుల్య్యాన్ని పాటించేలా, సౌకర్యవంతంగా పర్యావరణం ఉండేలా ఆస్పత్రికి కేంద్రీకృత ఎయిర్ కండిషన్ ను ఏర్పాటు చేశారు. వైద్యులు, పారామెడికల్ సిబ్బందికి ప్రత్యేక బ్లాక్ లు ఉంటాయి. అత్యవసర పరిస్థితుల్లో సరైన అగ్నినిరోధక ఏర్పాటు, మార్పురీ, వాహనాల పార్కింగ్ ప్రాంతాలను ప్రత్యేకంగా ఏర్పాటు చేశారు.

వైఫై, సీసీ టీవీ లతో పాటు హెల్ప్ లైన్ నంబర్లను కూడా అందుబాటులోకి తెచ్చి, ఆధునిక నిర్వహణ పద్ధతులను అమలు చేస్తున్నారు. ఇందుకోసం ఒక సాఫ్ట్ వేర్ ను కూడా నిర్వహిస్తున్నారు. అతి శీతల పరిస్థితులు ఉంటాయి కాబట్టి అందుకు అనుగుణంగా డాక్టర్లు, పారామెడికల్, భద్రతా సిబ్బందికి తగు ఏర్పాటు చేశారు.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726489>



Sat, 12 June 2021

DRDO developed 500-bed COVID hospital in Srinagar, becomes operational

Continuous oxygen supply is available for all 500 beds from 62 KL Liquid Medical Oxygen storage tanks

Srinagar: A 500-bed COVID Hospital at Khonmoh, Srinagar has become operational. The hospital has been set up by Defence Research and Development Organisation (DRDO) in a short span of 17 days and is funded by PM CARES Fund. This Covid facility includes 125 ICU beds with ventilators, of which 25 are exclusively reserved for children. Continuous oxygen supply is available for all 500 beds from 62 KL Liquid Medical Oxygen storage tanks. Hospital management and doctors and para-medical staff to run the facility are provided by the administration of the Union Territory of Jammu & Kashmir.



The hospital is centrally air-conditioned with cooling provisions for summers and heating capabilities during winters to maintain a comfortable environment. There is a separate block for doctors & para-medical staff. Proper fire exits in case of emergency, provision of steel structure shed having inside refrigerator for mortuary and parking facility for vehicles have also been provided at the centre.

A control centre with Wi-Fi, CCTVs, and helpline numbers has been established for proper monitoring and hospital management through modern system software. Due to cold weather, special arrangements have been made to accommodate 150 personnel including doctors, para-medical staff, pharmacy staff, security personnel, and maintenance staff.

The hospital will provide medical care to Covid-19 patients of UT of Jammu & Kashmir in this time of the pandemic.

<https://www.psuconnect.in/news/drdo-developed-500-bed-covid-hospital-in-srinagar-becomes-operational/28225>



Sat, 12 June 2021

श्रीनगर में DRDO के 500 बेड के कोविड हॉस्पिटल में मरीजों की भर्ती शुरू, अस्पताल में सभी आधुनिक सुविधाएं मौजूद

श्रीनगर के इस कोविड केयर सेंटर (Covid Care Center) में 125 ICU बेड शामिल हैं, जिनमें से 25 ICU बेड बच्चों के लिए रिजर्व हैं। 375 बिस्तरों पर 24 घंटे ऑक्सीजन (oxygen) की सुविधा है।

जम्मू में 500 बिस्तरों वाले कोविड केयर हॉस्पिटल (Covid Hospital) को बनाने के बाद रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने श्रीनगर (Srinagar) में केवल 17 दिन में 500 बेड्स का एक और अस्पताल तैयार किया है, जिसका बुधवार को उदघाटन भी किया जा चुका है। अब इस अस्पताल में मरीजों को भर्ती करना भी शुरू कर दिया गया है। इस कोविड केयर सेंटर (Covid Care Center) में वेंटिलेटर के साथ 125 ICU बेड शामिल हैं, जिनमें से 25 बच्चों के लिए रिजर्व हैं। ये अस्पताल पीएम केयर फंड से तैयार किया गया और चलाया जा रहा है।

श्रीनगर के इस कोविड सेंटर में सभी जरूरी आधुनिक सुविधाएं हैं। अस्पताल में एयर कंडीशन की व्यवस्था है और इसमें 125 ICU बेड शामिल हैं, जिनमें से 25 ICU बेड बच्चों के लिए रिजर्व हैं। 375 बिस्तरों पर 24 घंटे मेडिकल ऑक्सीजन (Oxygen) की सुविधा है। इसके अलावा 100 वर्ग मीटर में 10 बिस्तरों वाला ट्राइएज एरिया भी बनाया गया है। सभी मेडिकल सुविधाओं (Medical Facilities) का ट्रायल रन पूरा होने के बाद इस कोविड केयर सेंटर को चलाया जाना शुरू कर दिया गया है।

उपराज्यपाल ने की DRDO की तारीफ, सरकार का जताया आभार

उपराज्यपाल मनोज सिन्हा ने कोरोना के खिलाफ लड़ाई में महत्वपूर्ण भूमिका निभाने के लिए DRDO की सराहना की और कहा कि DRDO ने इतने कम समय में दोनों अस्पतालों को तैयार किया और जम्मू-कश्मीर में लोगों की सहायता के लिए 1000 अतिरिक्त बिस्तर जोड़ दिए हैं। साथ ही, उन्होंने जम्मू-कश्मीर में स्वास्थ्य देखभाल और मेडिकल सुविधाओं को बढ़ाने में जरूरी सहायता और हस्तक्षेप देने के लिए प्रधानमंत्री नरेंद्र मोदी, गृह मंत्री अमित शाह और रक्षा मंत्री राजनाथ सिंह का आभार जताया।

“जम्मू कश्मीर के स्वास्थ्य सिस्टम में देखा गया बड़ा सुधार”

एलजी ने कहा कि ये सब प्रधानमंत्री के व्यक्तिगत हस्तक्षेप के कारण हुआ है कि जम्मू-कश्मीर में स्वास्थ्य के बुनियादी ढांचे में इतने बड़े पैमाने पर सुधार देखा गया है। उन्होंने कहा कि महामारी के दौरान हेल्थ सिस्टम को बदलने के लिए केंद्र शासित प्रदेश सरकार की पहल में ICU और ऑक्सीजन की क्षमता के साथ बिस्तरों की संख्या में लगातार वृद्धि, पूर्व मेडिकल कर्मचारियों की तैनाती और नए योग्य कर्मचारियों की फास्ट ट्रैक तैनाती और तुरंत टीकाकरण अभियान शुरू करना शामिल है। उन्होंने कहा कि सामूहिक प्रयासों के कारण ही जम्मू-कश्मीर में अब मरीजों के इलाज की अधिक क्षमता है।

<https://www.tv9hindi.com/state/jammu-and-kashmir/pmcares-funded-drdo-500-bed-covid-hospital-at-srinagar-is-admitting-patients-693500.html>

DRDO launches "Chetan" Robot in Srinagar to help Covid health workers inside hospital ICU

The Defence Research and Development Organisation launched a 500-bed facility and a robot named "Chetan" in Srinagar to help health care workers fight COVID

By Vidyashree S

On Friday, June 11, the Defence Research and Development Organisation (DRDO) launched a 500-bed facility and a robot named "Chetan" in Srinagar. The DRDO's new invention will help health care workers fight COVID-19 in the Union Territory. It was first used in Delhi, and will now be operated in COVID hospital of Srinagar.

How does 'Chetan' Robo assist?

The COVID Hospital Electronic Angel robot or Chetan is an electronic robot designed and developed to assist COVID-19 patients inside the ICU or viral-loaded environment in COVID-19 hospitals or facilities.

A DRDO official said, "During the treatment of COVID, the patient feel isolated family and friends and so considering this situation we developed this device to facilitate communication".

To facilitate communication, an android app and a browser-based application to ensure users with a wider range of devices, including desktops, has also been developed. Equipped with a camera for the operators to navigate and monitor the patients, the robot has three trays and can move on flat surfaces.

Out of three trays, the first one carries tablets while the second tray is used to bring food and other medicines. Patients with less mobility can take these items from the tray and help themselves. The third tray is for water storage.

Chetan to the rescue of medical staff

To ease the work of ward attendants, the robot's camera will display the ward activities and in case of emergencies, medical consultation can also be sought. The robot also helps in reducing medical staff load by transporting food and medicines to the patients.

At the beginning of the Second wave of COVID, family members of patients complained about the lack of communication that has been resolved as this robot helps provide real-time information.

Scope to redesign the robot soon

The robot is made of materials that are easily available and accessible. At present, the Robo consists of only three trays but it can be redesigned to increase the number of trays in 2- 3 months. It's a remote-controlled device that can be updated to the intelligent system in the future. An updated version will have designed soon with enhanced features.

<https://www.republicworld.com/india-news/general-news/drdo-launches-chetan-robot-in-srinagar-to-help-covid-health-workers-inside-hospital-icu.html>



Credit: DRDO TWITTER

2-DG drug initially developed for cancer treatment, lures coronavirus by looking like glucose: Former DRDO Scientist

By Surendra Singh

New Delhi: Defence Research and Development Organisation's drug 2-deoxy-D-glucose (2-DG), which has been granted permission by drug regulator DCGI for emergency use as adjunct therapy in moderate to severe Covid-19 patients, was "initially developed to check the growth of cancerous cells".

As 2-DG's defence mechanism to check the growth of cancerous cells was the same as depriving the coronavirus of glucose in infected cells, therefore the DRDO decided to perform clinical trials on this drug for Covid-19 treatment on the suggestions of its scientists after the regulator's nod last year, a former senior DRDO scientist revealed.

Explaining 2-DG's defence mechanism, former DRDO veteran Ravi Kumar told TOI,

"Coronavirus uses glucose in infected cells as an energy source to multiply. 2-DG lures the virus by looking like glucose, which the virus feeds on but gets weakened when it doesn't get glucose for energy and thus the viral load gets reduced in patients after some days of drug intake."

In the 2-DG arm, a significantly higher proportion of patients improved symptomatically and became free from supplemental oxygen dependence (42% vs 31%) by day-3 in comparison to standard of care, indicating an early relief from oxygen therapy/dependence. A similar trend was observed in patients aged over 65 years, an MoD statement said recently.

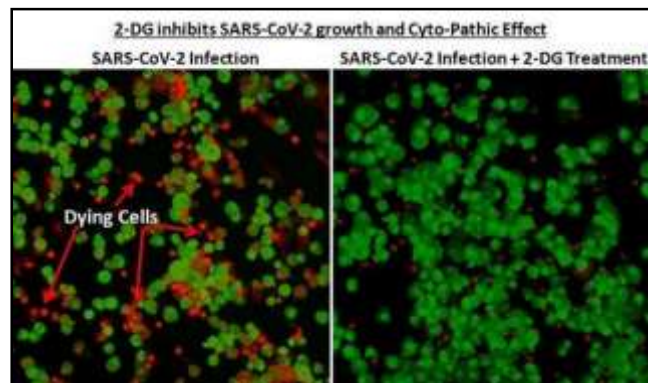
Talking to TOI, Praveen Chandra, Medanta hospital's chairman of interventional cardiology, said 2-DG has been tried till now on 15-20 patients in their hospital. "It has been quite good and improvements have been seen in patients after its second dose", he said, adding, "We have given the drug to patients for 5-7 days and have not seen any side-effects in these patients".

It all started when the pandemic struck India early last year and PM Modi called for development of indigenous vaccines and drugs to check Covid-19. Two senior scientists of the Institute of Nuclear Medicine and Allied Sciences (INMAS) of DRDO, Anant Narayana Bhatt and Sudhir Chandana, had then proposed at a DRDO meet, attended by its chairman Dr G Satheesh Reddy, that 2-DG, initially developed to check brain tumour, could be used for Covid treatment as the drug's defence mechanism was the same, Ravi Kumar said.

After their proposal was accepted, INMAS scientists conducted lab experiments with the help of Centre for Cellular and Molecular Biology (CCMB), Hyderabad, and found that the molecule worked effectively against SARS-CoV-2 and inhibited the viral growth. Based on these results, DCGI permitted a phase-II clinical trial of 2-DG in May 2020.

In the trials from May to October, the drug was found to be safe in Covid-19 patients, who showed significant improvement in their recovery. Phase IIa was conducted in six hospitals and Phase IIb (dose ranging) in 11 hospitals covering 110 patients.

The regulator further permitted phase-III clinical trials in November 2020. The trial was conducted on 220 patients between December 2020 to March 2021 at 27 Covid hospitals and the data was presented to the DCGI.



On May 01, 2021, DCGI gave the nod for its emergency use. DRDO, in collaboration with Dr Reddy's Lab, thereafter started the commercial production of 2-DG, which is now priced at Rs 990 per sachet. To augment its production, DRDO has recently invited expressions of interest from drug-makers to transfer the technology for 2-DG's mass production.

<https://timesofindia.indiatimes.com/india/2-dg-drug-initially-developed-for-cancer-treatment-lures-coronavirus-by-looking-like-glucose-former-drdo-scientist/articleshow/83496866.cms>

THE TIMES OF INDIA

Sat, 12 June 2021

Raj receives first batch of 2-DG drug after a long wait

Jaipur: After a long wait, the state has received only 450 sachets of anti-Covid drug 2-deoxy-D-glucose (2-DG), which was developed by DRDO in collaboration with Dr Reddy's laboratories, as a part of the first batch this week.

Another batch of 5,000 sachets of the drug will arrive next week, said Alok Ranjan, managing director of Rajasthan Medical Services Corporation Limited (RMSCL). The state government had placed a purchase order for 10,000 sachets of the drug in mid-May.

The anti-Covid-19 therapeutic application of 2-DG has been developed by Institute of Nuclear Medicine and Allied Sciences (INMAS), a lab of DRDO, along with Dr Reddy's Laboratories (DRL), Hyderabad. The drug comes in powder form in sachet, which is taken orally by dissolving it in water. It accumulates in the virus infected cells and prevents virus growth by stopping viral synthesis and energy production. As the number of active Covid cases has dropped to 9,023 in the state, there isn't much requirement of the drug in the current scenario.

"We haven't started it (prescribing the drug) yet. We will start it on a trial basis within a week. We will see how effective it is and then start using it," Dr Raman Sharma, professor, department of general medicine, SMS Medical College.

Meanwhile, the state has also received 336 vials of isavuconazole injection, which is a substitute for liposomal amphotericin B injection — an investigational drug for the treatment of black fungus or mucormycosis. The state government had placed an order for 780 vials of the drug.

The state government had placed a purchase order for 20,000 posaconazole tablets and injections. "Of the total purchased, 4,100 tablets have been received by the state. Also, 2,000 posaconazole injections have been received and distributed to the districts," said Rajan.

<https://timesofindia.indiatimes.com/city/jaipur/raj-receives-first-batch-of-2-dg-drug-after-a-long-wait/articleshow/83444789.cms>

DRDO on Twitter



Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Fri, 11 June 2021 1:19PM

Raksha Mantri Shri Rajnath Singh inaugurates BRO's two Centres for Excellence to promote road safety & road construction;

Lauds BRO's role in improving border infrastructure

Raksha Mantri Shri Rajnath Singh dedicated to the nation two Centres of Excellence established by Border Roads Organisation (BRO) at Seema Sadak Bhawan in New Delhi, on June 11, 2021. These Centres have been established to achieve excellence in road safety as well as foster growth in construction of roads, bridges, air fields and tunnels. The Centre of Excellence for Road Safety & Awareness (CoERSA) aims to create awareness about road safety through analysis sharing of road accidents and suggesting methods to save precious lives. The Centre of Excellence for Roads, Bridges, Air Fields and Tunnels (CoERBAT) focuses on institutionalising the knowledge gained over the years in development of almost 60,000 kilometres of roads, 56,000 metres of bridges, 19 airfields and four tunnels in the eastern and north-western part of the country.

Speaking on the occasion, Shri Rajnath Singh appreciated the efforts of BRO in establishing the Centres of Excellence, expressing confidence that they will play a pivotal role in saving precious lives. Terming road accidents as a silent pandemic that claims approx. 1.5 lakh lives every year, the Raksha Mantri stated that the Government has taken a number of initiatives such as National Road Safety Policy, Motor Vehicle Act 2020 and identification of black spots on national highways to tackle the problem and the setting up of these Centres is another step in that direction.

The Raksha Mantri lauded the crucial role played by BRO in the progress of the nation since its inception by building roads, tunnels and other infrastructure in remote areas. He praised the efforts of BRO for working tirelessly in tough weather conditions to increase connectivity in border areas, especially during the COVID-19 pandemic. Describing connectivity as an essential component of a nation's progress, he said BRO is catering to the needs of the Armed Forces as well as working towards the socio-economic development of the border areas. He made special mention of the recent achievements of BRO, including state-of-the-art construction of 'Atal Tunnel, Rohtang', Kailash Mansarovar Road and Zojila pass. He also appreciated BRO for raising awareness about road safety through innovative slogans and signboards.

Shri Rajnath Singh also listed out various measures taken by the Government for the development of BRO. These include increase in the budget of BRO, approval of special high-altitude clothing for the personnel as well as cadre review to boost the morale of the organisation. He assured BRO of continued support of Ministry of Defence, saying that the Government remains committed to the progress of the far-flung areas of the country. He also remembered the BRO personnel who laid down their lives in the service of the nation.

During the event, the Raksha Mantri also launched four software developed to optimise the work efficiency of BRO personnel, their HR management, recruitment management, enrolment and works management. The BRO has created the software to reduce paperwork, with focus on minimising the carbon footprint. Shri Rajnath Singh termed the development of the software as a great example of 'Self-reliant India' and 'Digital India' campaigns. He stated that the software will further improve the efficiency of the organisation, modernise it and save time.

The first ever Solo Woman Motorcycle Expedition by Ms Kanchan Ugursandi to Umling La Pass, Ladakh and back was also flagged off on the occasion. The Raksha Mantri extended his best wishes to Ms Kanchan Ugursandi and expressed confidence that she will come out with flying colours and complete the task by setting new records.

Earlier, DG Border Roads Lt Gen Rajeev Chaudhry briefed Shri Rajnath Singh on the initiatives and achievements of BRO in recent years. He informed the Raksha Mantri about the ongoing and future projects, with focus on AatmaNirbhar Bharat Abhiyaan envisioned by Prime Minister Shri Narendra Modi. He also informed Raksha Mantri on the awareness campaigns being carried out by BRO related to COVID-19 and Azadi ka Amrut Mahotsav in far-flung areas. The DG Border Roads said BRO remains committed towards serving the nation and would bring all necessary changes to enhance the efficiency of the organisation.

Chief of Defence Staff General Bipin Rawat and Defence Secretary Dr Ajay Kumar were among the dignitaries present on the occasion.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726182>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Fri, 11 June 2021 1:19PM

रक्षा मंत्री श्री राजनाथ सिंह ने सड़क सुरक्षा और सड़क निर्माण को बढ़ावा देने के लिए बीआरओ के दो उत्कृष्टता केंद्रों का उद्घाटन किया

सीमा पर अवसंरचना सुधारने में बीआरओ की भूमिका की सराहना की

श्री राजनाथ सिंह ने दिनांक 11 जून, 2021 को नई दिल्ली के सीमा सड़क भवन में सीमा सड़क संगठन (बीआरओ) द्वारा स्थापित उत्कृष्टता केंद्रों को देश को समर्पित किया। इन केन्द्रों की स्थापना सड़क सुरक्षा में उत्कृष्टता प्राप्त करने के साथ-साथ सड़कों, पुलों, हवाई क्षेत्रों और सुरंगों के निर्माण में वृद्धि को बढ़ावा देने के लिए की गई है। सड़क सुरक्षा और जागरूकता केंद्र (सीओईआरएसए) का उद्देश्य सड़क दुर्घटनाओं के विश्लेषण के साझाकरण के माध्यम से सड़क सुरक्षा के बारे में जागरूकता पैदा करना और बहुमूल्य जीवन बचाने के तरीके सुझाना है।

सड़कों, पुलों, वायु क्षेत्रों और सुरंगों (सीओईआरबीएटी) के लिए उत्कृष्टता केंद्र लगभग 60,000 किलोमीटर सड़कों, 56,000 मीटर पुलों, 19 हवाई अड्डों और देश के पूर्वी और उत्तर-पश्चिमी भाग में चार सुरंगों के विकास में वर्षों में प्राप्त ज्ञान को संस्थागत बनाने पर केंद्रित है।

इस अवसर पर श्री राजनाथ सिंह ने उत्कृष्टता केंद्र स्थापित करने में बीआरओ के प्रयासों की सराहना करते हुए विश्वास व्यक्त किया कि वे बहुमूल्य जीवन को बचाने में महत्वपूर्ण भूमिका निभाएंगे। सड़क दुर्घटनाओं को एक मूक महामारी बताते हुए रक्षा मंत्री ने कहा कि सरकार ने राष्ट्रीय सड़क सुरक्षा नीति,

मोटर वाहन अधिनियम 2020 जैसी अनेक शुरुआत की हैं और इस समस्या से निपटने के लिए राष्ट्रीय राजमार्गों पर ब्लैक स्पॉट की पहचान की है और इन केंद्रों की स्थापना इस दिशा में एक और कदम है।

रक्षा मंत्री ने सुदूर क्षेत्रों में सड़कों, सुरंगों और अन्य बुनियादी ढांचे के निर्माण के द्वारा अपनी स्थापना के बाद से राष्ट्र की प्रगति में बीआरओ द्वारा निभाई गई महत्वपूर्ण भूमिका की सराहना की। उन्होंने सीमावर्ती क्षेत्रों में विशेष रूप से कोविड-19 महामारी के दौरान कनेक्टिविटी बढ़ाने के लिए कठिन मौसम की स्थिति में अथक परिश्रम करने के लिए बीआरओ के प्रयासों की प्रशंसा की। कनेक्टिविटी को राष्ट्र की प्रगति का एक अनिवार्य घटक बताते हुए उन्होंने कहा कि बीआरओ सशस्त्र बलों की जरूरतों को पूरा करने के साथ-साथ सीमावर्ती क्षेत्रों के सामाजिक-आर्थिक विकास की दिशा में काम कर रहा है। उन्होंने 'अटल सुरंग, रोहतांग', कैलाश मानसरोवर रोड और जोजिला दर्रे के अत्याधुनिक निर्माण सहित बीआरओ की हालिया उपलब्धियों का विशेष उल्लेख किया। उन्होंने नवीन सोच वाले नारों और साइनबोर्ड के माध्यम से सड़क सुरक्षा के बारे में जागरूकता बढ़ाने के लिए बीआरओ की सराहना की।

श्री राजनाथ सिंह ने बीआरओ के विकास के लिए सरकार द्वारा किए गए विभिन्न उपायों को भी सूचीबद्ध किया। इनमें बीआरओ के बजट में वृद्धि, कर्मियों के लिए ऊंचाई वाले स्थानों पर पहने जाने वाले विशेष कपड़ों को मंजूरी देने के साथ-साथ संगठन का मनोबल बढ़ाने के लिए कैडर रिव्यू शामिल हैं। उन्होंने रक्षा मंत्रालय के निरंतर साथ का आश्वासन देते हुए कहा कि सरकार देश के दूर-दराज के क्षेत्रों की प्रगति के लिए प्रतिबद्ध है। उन्होंने राष्ट्र की सेवा में अपने प्राणों की आहुति देने वाले बीआरओ कर्मियों को भी याद किया।

कार्यक्रम के दौरान रक्षा मंत्री ने बीआरओ कर्मियों की कार्य दक्षता, उनके मानव संसाधन प्रबंधन, भर्ती प्रबंधन, नामांकन और कार्य प्रबंधन को अनुकूलित करने के लिए विकसित किए गए चार सॉफ्टवेयर भी लॉन्च किए। बीआरओ ने कार्बन फुटप्रिन्ट को कम करने को ध्यान में रखते हुए कागजी कार्रवाई को कम करने के लिए सॉफ्टवेयर बनाया है। श्री राजनाथ सिंह ने सॉफ्टवेयर के विकास को 'आत्मनिर्भर भारत' और डिजिटल इंडिया अभियानों का एक बड़ा उदाहरण बताया। उन्होंने कहा कि सॉफ्टवेयर से संगठन की कार्यकुशलता में और सुधार होगा, इसका आधुनिकीकरण होगा और समय की बचत होगी।

इस अवसर पर सुश्री कंचन उगरसंडी द्वारा लद्दाख के उमलिंग ला दर्रे और वापसी तक पहली बार सोलो महिला मोटरसाइकिल अभियान को भी हरी झंडी दिखाकर रवाना किया गया। रक्षा मंत्री ने सुश्री कंचन उगरसंडी को शुभकामनाएं दीं और विश्वास व्यक्त किया कि वह सफलता की नवीन उंचाइयां छूती हुई सामने आएंगी और नए कीर्तिमान स्थापित करके कार्य पूरा करेंगी।

इससे पहले सीमा सड़क संगठन के महानिदेशक लेफ्टिनेंट जनरल राजीव चौधरी ने श्री राजनाथ सिंह को हाल के वर्षों में बीआरओ की पहलों और उपलब्धियों की जानकारी दी। उन्होंने रक्षा मंत्री को प्रधानमंत्री श्री नरेंद्र मोदी द्वारा तैयार आत्मनिर्भर भारत अभियान की संकल्पना को दृष्टिगत रखते हुए वर्तमान में जारी और भविष्य की परियोजनाओं के बारे में बताया। उन्होंने रक्षा मंत्री को दूर-दराज के क्षेत्रों में कोविड-19 और आजादी का अमृत महोत्सव से संबंधित बीआरओ द्वारा चलाए जा रहे जागरूकता अभियानों की भी जानकारी दी। सीमा सड़क संगठन के महानिदेशक ने कहा कि बीआरओ राष्ट्र की सेवा के लिए प्रतिबद्ध है और संगठन की कार्यकुशलता बढ़ाने के लिए सभी आवश्यक बदलाव लाएगा।

इस अवसर पर चीफ ऑफ डिफेंस स्टाफ जनरल बिपिन रावत और रक्षा सचिव डॉ. अजय कुमार सहित अन्य गणमान्य लोग मौजूद थे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726323>



Coast Guard adds teeth to its aviation arm by inducting ALH Mk-III

In line with Atmanirbhar Bharat vision of Prime Minister Shri Narendra Modi, Defence Secretary Dr Ajay Kumar today inducted Advanced Light Helicopters (ALH) Mk-III in Indian Coast Guard (ICG). The state-of-the-art helicopters are indigenously designed and manufactured by Hindustan Aeronautics Limited (HAL), Bengaluru.

Dr Ajay Kumar in his address praised the perseverance of the ICG and HAL by inducting these helicopters in testing times and progressing our Prime Minister's vision of 'Make in India'. He also brought out the importance of having these advanced helicopters for ICG to operate them across the spectrum of Coast Guard operations. The ceremony was carried out in Bengaluru through digital means from New Delhi, keeping COVID-19 protocol at the fore and promoting 'Digital India' vision of the Government.

The ALH Mk-III marine version has been designed and developed with in-house customisation of 19 additional equipment by HAL to meet ICG requirements. The HAL will supply 16 ALH Mk-III to the ICG by mid next year. The helicopters are capable of undertaking embarked operations from ships which will enhance Coast Guard capabilities towards sea-air co-ordinated search, interdiction capabilities, coastal security, search and rescue operations, medical evacuation, humanitarian missions, pollution response missions, etc.

While appreciating ICG for the recently conducted successful operations of drugs & arms seizure and saving lives during cyclones Tauktae & YAAS, Defence Secretary said the capacity and capability augmentation of the service needs to be materialised in a time bound manner considering the onerous responsibilities bestowed on ICG by the Government.

On induction, the 16 ALH Mk-III will be positioned at four Coast Guard squadrons at Bhubaneswar, Porbandar, Kochi and Chennai. The shared maritime boundaries with littoral states are highly susceptible to illegal activities and the regions are prone to frequent cyclones. These squadrons with embarked operations will ensure seamless surveillance and provide assistance to fishermen in distress at sea.

Director General Coast Guard Shri K Natarajan while acknowledging the efforts of Tatrakshaks for recent concurrent successful operations said that the ICG is as prepared as ever to discharge its duties and induction of ALH Mk-III will usher a new paradigm shift in our capability to undertake ship borne operations and enhance surveillance prowess with extended reach. He also brought out that these helicopters will be deployed in a coordinated matrix alongwith ships and aircraft to strengthen the service capabilities in Area of Responsibility and beyond.

Chairman and Managing Director of HAL Shri R Madhavan and other senior officials of Ministry of Defence were among those who attended the event.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726510>





पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sat, 12 June 2021 2:43PM

तटरक्षक बल ने उन्नत हल्के हेलीकॉप्टर एएलएच एमके-III को शामिल करके अपनी विमानन शाखा में नए आयाम जोड़े

प्रधानमंत्री श्री नरेन्द्र मोदी के आत्मनिर्भर भारत दृष्टिकोण के अनुरूप, रक्षा सचिव डॉ. अजय कुमार ने उन्नत हल्के हेलीकॉप्टर (एएलएच) एमके-III को आज भारतीय तटरक्षक बल (आईसीजी) में शामिल किया। ये अत्याधुनिक हेलीकॉप्टर हिंदुस्तान एयरोनॉटिक्स लिमिटेड (एचएएल), बंगलुरु द्वारा स्वदेशी रूप से तैयार और विकसित किए गए हैं।

डॉ. अजय कुमार ने प्रधानमंत्री नरेन्द्र मोदी के 'मेक इन इंडिया' दृष्टिकोण को आगे बढ़ाने और इन हेलीकॉप्टरों को परीक्षण के समय में शामिल करने के लिए आईसीजी तथा एचएएल की दृढ़ता की प्रशंसा की। उन्होंने आईसीजी के पास इन उन्नत हेलीकॉप्टरों के होने के महत्व को भी रेखांकित किया, ताकि उन्हें तटरक्षक बल के संचालन के सभी क्षेत्रों में उपयोग में लाया जा सके। सरकार के 'डिजिटल इंडिया' दृष्टिकोण को बढ़ावा देने के लिए इस समारोह को नई दिल्ली से डिजिटल माध्यमों के जरिये बंगलुरु में आयोजित किया गया था और इस दौरान कोविड -19 प्रोटोकॉल को प्राथमिकता दी गई।



एएलएच एमके -III के समुद्री संस्करण को आईसीजी की आवश्यकताओं को पूरा करने के लिए एचएएल द्वारा 19 अतिरिक्त उपकरणों के घरेलू अनुकूलन के साथ स्वदेश में ही डिजाइन और विकसित किया गया है। एचएएल अगले साल के मध्य तक आईसीजी को 16 एएलएच एमके-III की आपूर्ति करेगा। ये हेलीकॉप्टर नौसैनिक पोतों से संचालित किये जाने वाले अभियानों के दौरान होने वाले कार्यों को पूरा करने में सक्षम हैं। एएलएच एमके-III समुद्री और हवाई माध्यमों से समन्वित खोज, अवरोध क्षमताओं, तटीय सुरक्षा, खोज और बचाव कार्यों, चिकित्सा सहायता, फंसे हुए लोगों को निकालने तथा प्रदूषण प्रतिक्रिया मिशन आदि के लिए तटरक्षक बल की क्षमताओं में वृद्धि करेंगे।

रक्षा सचिव ने हाल ही में दवाओं एवं हथियारों की जब्ती के सफल संचालन तथा चक्रवात तौकते और यास के दौरान लोगों की जान बचाने के लिए आईसीजी की सराहना की। रक्षा सचिव ने कहा कि, सरकार द्वारा आईसीजी को सौंपी गई महत्वपूर्ण जिम्मेदारियों को देखते हुए सेवा की क्षमता और इसकी सामर्थ्य वृद्धि को समयबद्ध तरीके से अमल में लाने की आवश्यकता है।

शामिल होने पर, 16 एएलएच एमके-III को भुवनेश्वर, पोरबंदर, कोच्चि और चेन्नई में चार तटरक्षक स्क्वाड्रनों में तैनात किया जाएगा। समुद्रतटीय राज्यों के साथ साझी समुद्री सीमाएं अवैध गतिविधियों के लिए अतिसंवेदनशील हैं और ये क्षेत्र अक्सर चक्रवातों के लिए प्रवण होते हैं। शुरु किए गए ऑपरेशन के साथ ही ये स्क्वाड्रन निर्बाध निगरानी सुनिश्चित करेंगे और समुद्र में संकट में फंसे मछुआरों को सहायता प्रदान करेंगे।

तटरक्षक महानिदेशक श्री के नटराजन ने हाल के संयुक्त सफल अभियानों के लिए तटरक्षकों के प्रयासों की सराहना करते हुए कहा कि, आईसीजी अपने कर्तव्यों का निर्वहन करने के लिए हमेशा की तरह तैयार है। उन्होंने कहा कि, एएलएच एमके-III के शामिल होने से पोत जनित संचालन करने और विस्तारित पहुंच के साथ निगरानी कौशल को बढ़ाने की हमारी क्षमता में एक नया बदलाव आएगा। उन्होंने यह भी बताया कि, जिम्मेदारी के क्षेत्र और उससे आगे की सेवा क्षमताओं को मजबूत करने के लिए इन हेलीकॉप्टरों को पोतों तथा विमानों के साथ एक समन्वित मैट्रिक्स में तैनात किया जाएगा।

इस कार्यक्रम में एचएएल के अध्यक्ष और प्रबंध निदेशक श्री आर माधवन तथा रक्षा मंत्रालय के अन्य वरिष्ठ अधिकारी भी उपस्थित थे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1726578>

Business Standard

Mon, 14 June 2021

Rajnath approves support of Rs 499 cr for innovations in defence sector

Defence Minister Rajnath Singh has approved budgetary support of nearly Rs 499 crore for research and innovation in the defence sector for the next five years

New Delhi: Defence Minister Rajnath Singh has approved budgetary support of nearly Rs 499 crore for research and innovation in the defence sector for the next five years.

The Defence Ministry on Sunday said the funds will be used to provide financial support to nearly 300 start-ups, micro, small and medium enterprises (MSMEs) and individual innovators with a larger goal of ensuring self-reliance in the defence sector.

The scheme is in sync with the government's push to cut imports of military hardware and weapons and make India a hub for defence manufacturing.

"Defence Minister Rajnath Singh has approved the budgetary support of Rs 498.8 crore to Innovations for Defence Excellence (iDEX)-Defence Innovation Organisation (DIO) for the next five years," the ministry said in a statement.

It said the iDEXDIO has the primary objective of self-reliance and indigenisation in the defence and aerospace sector.

The ministry said the setting up of the iDEX framework and establishment of the DIO by the Department of Defence Production (DDP) is aimed at creating an ecosystem to foster innovation and technology development in the defence and aerospace sector.

"The scheme, with budgetary support of Rs 498.8 crore for the next five years, is aimed at providing financial support to nearly 300 start-ups/MSMEs/individual innovators and 20 partner incubators under the DIO framework," the ministry said.

It said the DIO will enable the creation of channels for innovators to engage and interact with the Indian defence production industry.

"The scheme aims to facilitate rapid development of new, indigenised and innovative technologies for the Indian defence and aerospace sector to meet their needs in shorter timelines," it said.

In the last couple of years, the government has unveiled a series of reform measures and initiatives to make India a hub of defence manufacturing.



Last August, Defence Minister Singh had announced that India will stop the import of 101 weapons and military platforms like transport aircraft, light combat helicopters, conventional submarines, cruise missiles and sonar systems by 2024.

A second negative list, putting import restrictions on 108 military weapons and systems such as next-generation corvettes, airborne early warning systems, tank engines and radars, was issued this week.

In May last, the government announced increasing the FDI limit from 49 per cent to 74 per cent under the automatic route in the defence sector.

India is one of the largest importers of arms globally.

The government now wants to reduce dependence on imported military platforms and has decided to support domestic defence manufacturing.

The ministry has set a goal of a turnover of USD 25 billion (Rs 1.75 lakh crore) in defence manufacturing in the next five years that included an export target of USD 5 billion (Rs 35,000 crore) worth of military hardware.

(Only the headline and picture of this report may have been reworked by the Business Standard staff; the rest of the content is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/current-affairs/rajnath-approves-support-of-rs-499-cr-for-innovations-in-defence-sector-121061300253_1.html



Sat, 12 June 2021

Rajnath Singh approves new policy for declassification of war histories

“Timely publication of war histories would give people accurate account of the events, provide authentic material for academic research and counter the unfounded rumours,” the MoD’s statement noted

By Dinakar Peri

New Delhi: In a major policy that could see declassification of war histories after 25 years, Defence Minister Rajnath Singh has approved the policy on archiving, declassification, compilation and publication of war and operations histories by the Ministry of Defence (MoD), a Ministry statement said on Saturday.



“The responsibility for declassification of records rests with the respective organisations as specified in the Public Record Act 1993 and Public Record Rules 1997, as amended from time to time. According to the policy, records should ordinarily be declassified in 25 years. Records older than 25 years should be appraised by archival experts and transferred to the National Archives of India once the war/operations histories have been compiled,” the Ministry said.

The policy envisages that each organisation under the MoD such as Services, Integrated Defence Staff, Assam Rifles and Coast Guard, will transfer the records, including war diaries, letters of proceedings and operational record books, etc., to the history division of MoD for proper upkeep, archival and writing the histories, the statement said.

The History Division will be responsible for coordination with various departments while compiling, seeking approval and publishing of war and operations histories. “The policy mandates constitution of a committee headed by Joint Secretary, MoD and comprising of representatives of the Services, Ministry of External Affairs (MEA), Ministry of Home Affairs (MHA) and other

organisations and prominent military historians (if required), for compilation of war/ operations histories.”

“The policy also set clear timelines with regard to compilation and publication of war/operations histories,” the statement said adding the above-mentioned Committee should be formed within two years of completion of war/operations. Thereafter, collection of records and compilation should be completed in three years and disseminated to all concerned.

The requirement of having war histories written with clear cut policy on declassification of war records was recommended by Kargil Review Committee headed by K Subrahmanyam as well as N N Vohra Committee in order to analyse lessons learnt and prevent future mistakes. Post Kargil conflict, Group of Ministers (GoM) recommendations on national security also mentioned the desirability of authoritative war history.

However, it is still not clear if the highly confidential Henderson Brooks report of the 1962 war with China would be declassified under the new policy. A defence official said the committee will consider, and take a view on earlier wars and operations. The compiled history on wars and operations, within five years will be for internal consumption first, and later committee may decide to publicly release whole or parts of it, considering sensitivity of the subject, the official stated. “Timely publication of war histories would give people accurate account of the events, provide authentic material for academic research and counter the unfounded rumours,” the statement added.

<https://www.thehindu.com/news/national/rajnath-singh-approves-policy-on-archiving-declassification-of-war-histories/article34795946.ece>

INDIA
TODAY

Sun, 13 June 2021

Indian Army gets new boats for quick troops deployment and surveillance

New and upgraded boats were delivered to the India Army for quick troops deployment and surveillance in water bodies like Ladakh's Pangong Lake

By Abhishek Bhalla

New Delhi: The Indian Army has begun to get deliveries of new boats suited for deployment in water bodies like Ladakh's Pangong Lake for ferrying troops and surveillance, sources said.

There are two types of boats that the army needed, one for patrolling and surveillance and the other for quick deployment of troops on the banks of the lake to reduce the time taken to manoeuvre the mountainous terrain.

The Indian Army is set to get 29 boats delivered in batches over the next few months. These boats can carry around 20 troops along with their equipments and can be used for quick mobilisation.

In January, the army had ordered 12 boats for surveillance and patrolling purposes. Additionally, 17 more boats were required for ferrying troops that are part of quick reaction team.

“Both the orders were made around the same time earlier this year and now deliveries have started,” said an official.

These boats can be used in all water bodies where the army is deployed, sources said



The Indian Army is set to get 29 new boats delivered in batches over the next few months. (Photo: Getty Images/ for Representation)

The indigenously built strong boats are superior to the capabilities of the boats that were being used till now. They have better anti-ramming capabilities and enhanced capacity to accommodate additional troops.

The Indian Navy has also been using such flat bottomed boats for troop and equipment deployment.

India-China stand-off on banks of Pangong Lake

The need was felt to upgrade the patrolling boats with anti-ramming capabilities and also have new boats for quick induction of troops amid the India-China military tussle in Ladakh that started last year in May. There were clashes between Indian and Chinese troops on the banks of Pangong Lake amid the stand-off last year.

It was felt that apart from patrolling, boats are needed for quick troop deployment as it would result in reducing deployment time that requires manoeuvring the tough terrain on land.

While there has been disengagement at the 14,000-foot high Pangong Lake, there has still not been any de-escalation across Eastern Ladakh. Other friction points including Gogra, Hot Springs and Depsang still need to be resolved.

Two-thirds of the 134km-long disputed Pangong Lake is under Chinese control. Effectively, India controls about 45 km of the lake.

The contested area of the lake is divided into 8 Fingers, with India claiming territory up to Finger 8. Mountain spurs jutting into the lake are referred to as Fingers in military parlance to describe the features.

As part of the agreement, China has gone back to Finger 8 and India troops moved to Finger 3 near Dhan Singh Thapa Post.

The face-offs would happen when Indian patrols go beyond Finger 4 and the Chinese also make incursions trying to come up to Finger 2.

However, for the time being patrolling upto Finger 4 is not taking place as part of an agreement between India and China.

The Pangong Lake is frozen through the winter and the Indian Army was aiming to have new boats by this summer.

The Indian troops don't have a luxury of a road as it ends one km before Finger 4. In this context, the new boats meant for quick deployment would be a big boost for the army.

<https://www.indiatoday.in/india/story/indian-army-new-boats-quick-deployment-surveillance-1814095-2021-06-12>

Retooling for war in super-high altitudes

*The Indian Army has been on top of the threat from the plains.
But it needs new technologies for operations at super-high altitudes*

By Lt Gen. P. Ravi Shankar (Retd)

The Indian armed forces are rebalancing along the northern borders. The total number of troops in super-high altitudes (over 12,000 feet) will increase manifold. Rebalancing additional forces into super high altitudes has implications on operational efficiency, financial impact and logistic viability. Our experience of last year's confrontation with the People's Liberation Army of China in eastern Ladakh, more than three decades on in the Siachen Glacier and other super-high altitudes in the north and the east indicates that we must invest in certain technologies to contend with China effectively along the LAC (Line of Actual Control). Very importantly, super-high altitudes are like space—devoid of resources where survival is the first mantra. Significantly, these areas will not always require the latest technologies. They require ones that can survive the environment and function there. The best technology is the one that 'works' in super high altitudes. Many a time, technologies fail during operations. At that point, it is the man and his will to fight with what he has that becomes paramount. We should not lose sight of this fact.



A Bofors gun deployed along the LAC during the India-China face-off; Photo by Bandeep Singh

The first prerequisite in any operational scenario is to enhance 'battlefield transparency' in depth across the LAC. This is achievable through a combination of applied technologies related to space, manned and unmanned ground as also aerial systems. These systems have to be backed by night vision, GIS and AI to get a clear 24x7 picture of the battlefield. This is a constant requirement before, during and after battle.

There is an undeniable requirement for engagements deep in enemy territory. Enhancing the reach of our guns, rockets, missiles, loitering systems and aircraft (manned and unmanned) through latest propulsion, control and guidance systems and related technologies will contribute to better interdiction and deterrence capabilities. Enhancing reach also reduces total numbers, improves flexibility and widens area coverage. This core technology will always be denied to us unless we develop it on our own.

Precision engagement increases accuracy and efficacy while decreasing battlefield logistics load. It also contributes significantly to surprise and 'first salvo effectiveness'. Both are very important factors in super-high altitudes where observation is difficult and logistics a nightmare. Technologies related to target designation and acquisition are the first step in precision engagement. We need to get the shape, size and posture of the target right and then home in precisely to destroy it. Hence, technologies related to terminal guidance, seekers, AI, space and GIS assume criticality in this sphere. Precision technologies may seem costly initially but will be more cost-effective in the long run.

Communications and networks are the life-blood of battlefields. As we modernise and expand into net-centric warfare, one must seriously look at porting 5G and cyber technologies to high altitudes. Simultaneously, there is a need to have a stable, ground-based communication base using high carriageway fibreoptics. Use of space-based relay centres/ hubs and AI will enhance

connectivity as well as bring in seamlessness in operational areas. An important part of communications is to miniaturise them into handheld systems.

Future battlefields will also be energy intensive. Energy will be at a premium in super-high altitudes where resources are scarce. Living and survival in super-high altitudes demands considerable energy. Every ground, aerial or communication system needs energy. The armed forces have no choice but to transit from fossil fuels to renewables and fuel cells for energy requirements. Renewable energy based on wind, solar and hydrogen technologies will dominate the future energy mix. They will not only be cost-effective but also lead to huge savings in logistics besides being environment-friendly.

Mobility in extreme battlefield conditions is of paramount importance. On foot and animal-based mobility will have to be enhanced by lightweight and tough materials. Vehicle-based mobility has to be enhanced by permafrost technologies. A combination of the two will enhance our reactions in defensive/ offensive operations in the desired time-frame. In addition, these technologies will be of high value in the creation of infrastructure required to operate in these conditions.

Technologies that enhance survivability have to be seen from different perspectives—individual, collective and medical. These relate to people. Simultaneously, weapons systems and other warlike stores also must be made durable. Survivability has to be seen from two further perspectives. First, everything has to survive the environment; second, it has to outlast enemy action. Inter se priority of technologies for super-high altitudes is based on a fundamental reality. One has to survive the environment to be able to fight in it. Hence, habitat and energy-related technologies are prime technologies. Also, combat is not an everyday occurrence, although its prevention by being forewarned is a 24x7 activity. Technologies that enhance battlefield transparency and reach assume greater importance.

Ideally, all these identified technologies should be indigenous in nature. India should be self-sufficient through ‘Aatmanirbhar’ programmes. However, that is not feasible for many reasons. In many cases, we should not reinvent the wheel but look ahead to next-gen technology. It is also important to understand that many of these identified technologies are in a fairly mature state within the country. The challenge before the armed forces lies not in availability but in harnessing and inducting them into the battlefield. It is in this arena that the Indian military system has constantly failed. Some of these technologies will have to be mastered, since they will not be given to us. We must develop these in a ‘technology denial’ regime. At another level, we should acquire niche technologies that will give us technological superiority with which we can dominate the battlefield. Some technologies can be acquired through shared programmes/ trade with our partners. Many of these technologies are dual-purpose and should be developed through civil-military fusion. In all cases, there is a serious need for a defence technology development programme on mission mode steered by the services.

(The author is former Director General, Artillery)

<https://www.indiatoday.in/magazine/defence/story/20210621-retooling-for-war-in-super-high-altitudes-lt-gen-p-ravi-shankar-rettd-1813375-2021-06-11>

Submarines or carriers?

India needs both. Short-term fiscal constrictions must be weighed against long-term strategic visions

By Rear Admiral Sudhir Pillai (Retd)

India finds itself in a strange situation. On one hand, the Chief of Defence Staff says the Indian Navy does not need aircraft carriers, while the Chief of Naval Staff has been emphasising their continued utility. This needs to be looked at from a deeper strategic perspective lest we straitjacket military readiness at a time when the demands on the Indian Navy continue to rise.

With reference to the Chinese Navy's rising competence, Sir Julian Corbett's *Some Principles of Maritime Strategy* is informative. 'The object of naval warfare must always be directly or indirectly either to secure command of the sea or to prevent the enemy from securing it.' The shifting balance of power, aided by China's economic rise and the emergence of a powerful Chinese Navy and associated land-based sea-denial forces, has forced the US and, in recent days, Britain, Canada and the EU, to pivot to the Indo-Pacific. Initiatives such as the QUAD, QUAD Plus and the Indo-Pacific Command are all aimed to protect the international maritime system.



A MiG 29K takes off from INS Vikramaditya

The challenge emanating from the aggressiveness of China in the South and the East China Sea requires navies to think through sea-control concepts afresh and search for innovative counters to anti-access and area-denial strategies. While it is beyond the scope of this article to look at doctrinal roles in detail, navies examine such aspects in great detail, and such assessments can be revealing.

In areas where shore-based air support is viable, India will need to evolve joint operational-level schemes between the Indian Navy and the Indian Air Force when it creates air defence or maritime theatre commands. Aircraft carriers remain relevant beyond such areas and can at times be the only go-to option. An aircraft carrier group can autonomously seek localised sea control when conveying critical cargo or mount sea-denial challenges using integral anti-submarine helicopters. Assessments also suggest that the development of unmanned aircraft could revitalise the role of aircraft carriers as the eyes of the fleet. Navies look to operate various Unmanned Aerial Vehicles (UAVs) from aircraft carriers to conduct C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) missions or as airborne relay nodes for networks that may be vulnerable to satellite destruction or electronic jamming. Thus, plans for the second indigenously-built aircraft carrier, INS *Vishal*, would serve India well. Such projects would also help develop shipbuilding and industrial competencies.

A popular perception is that submarines can provide sea control given their relative stealth and invulnerability. However, it must be considered that submarines are essentially a warfighting-only platform, while ships like aircraft carriers are valuable platforms for roles across the spectrum of conflict. A Carrier Battle Group (CBG) is a valuable adjunct as a submarine-support vessel. CBGs can not only provide C4ISR services but also disrupt enemy air and surface anti-submarine warfare (ASW) efforts, and even conduct ASW operations themselves.

In 2015, the Indian Navy released a strategy document, 'Ensuring Secure Seas: Indian Maritime Security Strategy' (IMMS-2015), as guidance for the Indian Navy's growth, development and

deployment in the coming years. The document outlined the need to develop future naval fleets to include three CBGs, each centred on an aircraft carrier with multi-mission escorts and support ships. These plans focus on ‘future challenges’ with planned force levels of 200 warships and a 500-aircraft fleet by 2027. Whilst these numbers represent a bean-counting exercise for hulls and airframes, IMMS- 2015 flags the need for how these platforms will need to adapt ‘leapfrogging technologies’ capable of combating emergent threats. These hulls and airframes will need to evolve through their lifecycle through innovative mid-life upgrades, functional enhancements, system expansions, retrofits and overhauls. As technologies mature, one may well see some of these upgrades leading to artificial intelligence replacing human operators!

No plan on paper can achieve much without budgetary support. India’s economic growth has, however, stalled since 2017. The naval budget has been scaled back from 18 per cent of the total defence budget in 2012-13 to 13.66 per cent in 2018-19. The modernisation budget of the Navy has been scaled back from 8.7 per cent in 2015-16 to 4.9 per cent in 2018-19. The operational implication of these cuts needs close consideration. Navies the world over evolve by striking a balance between doctrinal roles and operational imperatives vis-a-vis fiscal reality. What is essential is to balance the necessities of maritime imperatives against continental strategies by apportioning budgetary support.

While the deadlock on military de-escalation in Ladakh continues, Lt Gen. Prakash Menon, a former military advisor to the National Security Council Secretariat, cautions us to view the military moves in Ladakh from the broader perspective of China-US geopolitical rivalry. He opines that China views India as an impediment to its ambitions, given India’s maritime geography and deepening concert with other naval powers. If such assessments have a basis, India would do well not to stall investments towards the build-up of the Indian Navy’s capabilities and capacities at sea. Thus, budgetary support can be crucial to ensure that the evolving ‘string of pearls’ does not become a noose.

Air Marshal M. Matheswaran, in a study undertaken for the ANU National Security College/ the Australian Department of Defence, opines: ‘A third aircraft carrier is a vital necessity for the Indian Navy, given the current tensions with China. But with the Indian government delaying its decision, the chances of a decision favourable to the navy may be receding.’ Significant Chinese naval development and the emergence of that force with formidable operational structures permitted by new generations of weapons and sensors require the Indian Navy to be structured and built for evolving missions and a vision extending far beyond Indian shores.

Studies of Japanese and Chinese military progress reveal the development and nurturing of innovative funding models. India needs to embrace private and public-private enterprise as envisioned in the Strategic Procurement model. Else the Indian Navy’s capability, built at considerable time and effort, could erode. We must not turn the clock back.

The author is a former Assistant Chief of Naval Staff (Air)

<https://www.indiatoday.in/magazine/defence/story/20210621-submarines-or-carriers-rear-admiral-sudhir-pillai-rettd-1813715-2021-06-11>

The changing dynamics of war

India's standoff with China in Ladakh underscores the grey zone between peace and war. The days of conventional wars with clear-cut military victories are over

By Lt Gen. Rakesh Sharma (Retd)

Half a century ago, the Indian armed forces' campaign with the Mukti Bahini (guerrilla resistance movement in East Pakistan) led to the dismemberment of Pakistan and the creation of Bangladesh. It decimated the war-waging potential of the Pakistan Army, whose 93,000 personnel were taken as prisoners of war. In all metrics of warfare, this was an exceptional and decisive military victory that should have ensured a politically favourable post-war settlement for the long term.

The victory should have buried the intemperate words of Zulfikar Ali Bhutto in the UN Security Council on September 22, 1965: "We will wage a war for a thousand years (against India)" Shortly after the 1972 Simla Agreement, Bhutto came up with "we (Pakistan) will eat grass, even go hungry, but we will get one of our own (atom bomb)... We have no other choice!" His doctrine of bleeding India by "inflicting a thousand cuts" was vigorously pursued in Punjab and later in Jammu and Kashmir. It is apparent, in hindsight, that even a decisive military win, like in 1971, could not be translated into a strategic victory over Pakistan.



Termination of war used to have several metrics to indicate victory, such as the armed forces of one side capitulating and laying down arms, destruction of war-waging potential and capture of enemy territory. Capturing enemy territory was most often taken as a valid military objective to set conditions for political capitulation. Victory was measured by the consequent deposing of the other side's political system or hierarchy, called regime change.

Warfare has always been evolutionary. The sprint in military technologies has placed warfare on a decisive threshold to transit into new modernity. Future wars will also have asymmetric battle space that will include cyber, social, economic, informational and psychological domains. They may not necessarily involve physical combat or destruction or even direct engagement between the armed forces. Evolving technologies will significantly define how conventional wars will be fought. Machines will make life-and-death engagement decisions, with or without human interface.

Fast forward to the 21st century. India has adversarial relations and disputed borders with Pakistan and China. India was a hair's breadth away from a conventional war with Pakistan in the aftermath of the attack on Parliament in December 2001. Last summer, Chinese expansionist designs in eastern Ladakh had the potential of escalation with the quantum of forces arrayed. With the PLA (People's Liberation Army) knocking at our door, the concept of 'victory' needs to be revisited.

A grey zone exists between peace and war, where the aggressor attempts to achieve its objectives below the threshold of warfare. One can fall back on the ubiquitous Chinese military strategist Sun Tzu saying, "The epitome of martial excellence isn't winning every battle but winning without fighting." It implies putting an opponent at such a massive disadvantage that war-fighting is unnecessary and the national objectives can be met without bloodshed.

In the standoff in eastern Ladakh, China's playbook of demonstrating overwhelming force, subterfuge, or using cyber or informational warfare did not undermine India or push the Indian military into a disadvantageous situation. India has immense resilience and capacity to bear

hardships—the nation has the psychological and the military physical will to stand firm. The nation, hence, contested brinkmanship, the notion of ‘winning without fighting’, coercion and intimidation. Military coercion focused on threat and infliction of enough pain can never deter or coerce the Indian armed forces. ‘Winning without fighting’, for India, is just a cliché!

It is repeatedly said that conventional wars are passé. The argument is fraught with grave dangers. This century has witnessed how conventional wars can end up as protracted engagements. With the US forces set to leave Afghanistan, it is being asked if the aims of their two-decades-long war were achieved and if the withdrawal will now bring lasting peace.

What will be the end state of a conventional war, and what does victory imply? Questions like these seek answers. Armed conflicts may involve urban warfare, will certainly be highly lethal and, despite the use of precision weaponry, inflict collateral damage and lead to high human casualties. However, the salience of kinetic wars or the conflagrations across the Line of Control (LoC) and International Border (IB) with Pakistan and the Line of Actual Control (LAC) with China, the pressure on territory cannot be obviated due to the nature of the dispute. The Indian armed forces are well grounded, trained and experienced in kinetic conventional warfare.

Contextually, 21st century victories will not be based on the metrics of territory captured and destruction of the war-waging potential of the enemy. Indeed, borders cannot be redrawn by force; any ingress will have to face the massive weight of lethal, precision weaponry. Territory will invariably be bartered in post-war political negotiations. Prospective conventional wars will be fluid and extremely complicated as they will, more often than not, take surprising twists and turns. At the war-termination stage, different conclusions will have to be drawn, with newer definitions of winning or losing. Even if there is tactical or operational military victory, it may not guarantee operational or strategic results. Victory will invariably remain imprecise and the end state may not even seem a victory. It must also be appreciated that an adversary, come what may, will not be able to claim any ‘victory’ against India—territorial or otherwise.

Before any war begins, it is hence important to contemplate and define the minimum-maximum end states and follow them through. It is also essential that our armed forces plan towards achieving clear indicators of tactical and strategic advantages/ successes as an essential metric of war fighting, at all stages of war. The politico-bureaucratic establishment needs to be involved in bringing in sophistication in military strategies, based on logical, conceivable scenarios and response options thereof, and in formulation of war-termination strategic advantages. The days of wars ending in crisp, clear-cut military victories are over.

(The author is former GoC, 14 Corps, and former Adjutant General, Indian Army)

<https://www.indiatoday.in/magazine/defence/story/20210621-the-changing-dynamics-of-war-lt-gen-rakesh-sharma-retcd-1813374-2021-06-11>

Many-headed dragon in the Indo-Pacific

Jaws, claws and lashing tail, the PLA is a beast with a composite approach to warfare. It may use ‘the five Ps’ against us in the future

By Rear Admiral Sudarshan Shrikhande (Retd)

The title for this column is meant to be more deliberate than dramatic. Chinese seapower in the western Pacific, its current primary area of concern, is already well and truly multi-dimensional. The PLA-N (People’s Liberation Army-Navy) is its lead instrument. But land, air, space and cyber dimensions are its important and growing partners. That may well be the reality in the Indian Ocean as well a decade from now. The signs are discernible if we wish to read the tea leaves.

More specifically, the Chinese navy has grown at a pace never seen before. Even the raising of a navy by the Spartans—a formidable land power—in the Peloponnesian war of 4 BCE, which then defeated Athens, an established seapower, falls short for pace of growth. A recent report by the CSIS (Center for Strategic and International Studies, Washington, D.C.) puts it starkly: ‘Between 2014 and 2018, China launched more submarines, warships, amphibious vessels and auxiliaries than the number of ships currently serving in the navies of Germany, India, Spain and the United Kingdom.’



[Xi Jinping inspects an honour guard before boarding the Xining, one of the PLA-N’s latest destroyers, Apr. 2019; Photo by Li Gang/ AP](#)

In essence, their likely strategic and operational frameworks for the IOR (Indian Ocean Region) may mimic those for the first and second island chains. The PLA’s active-defence, sometimes vaguely termed in the West as A2AD (Anti-access/ Area Denial), is essentially sea control (with concomitant sea denial). This is in multiple dimensions, employing diverse instruments and welded with relatively recent major steps in integration (at Beijing) and jointness (in the joint theatres and supporting commands). The US and its allies are evolving joint services’ strategies and operational concepts to degrade the efficacy of the PLA-N operating relatively close to its own coast and bases. In turn, the PLA has several other arrows in its quiver. These include coastal and inland cruise and ballistic missiles capable of conventional land attack as well as in anti-ship versions (ASBM); and perhaps a new family of hypersonic weapons as well. Other longer range conventional missiles and, of course, the nuclear deterrent of the PLA Rocket Forces provide the deeper muscle. The PLA Air Force and PLA Naval Aviation both have long-range search and attack capabilities with several precision weapons that include ASCMs (anti-ship cruise missiles) and even air-launched ballistic ordnance. Finally, the PLA’s Strategic Support Forces bring the cyber, space, information and psychological warfare together with increasingly fused command and control networks. Taken together, it may not be a stretch to think of it as a dragon that shows a composite approach to warfare from jaws and claws to the tip of its lashing tail. The 2020 US DOD (Department of Defense) China Military Power Report shows the concern that the US, with a larger budget, greater technological sophistication and a global and powerful navy, now feels. In short, I would describe China’s advantages as a “5-P” mantra: Position, Precision, Persistence, Privilege (of pro-active choices to make) and, finally, a Panoply of ways to deliver ordnance and effects on adversaries.

While China’s challenges in the Indian Ocean are different, they may not seem necessarily greater to Beijing. In the western Pacific, it comes up against the US and its allies. While eventual uncertainty prevails as to whether the US will fight alongside Japan for, say, the Senkakus (as James Holmes posits—“what is the value of the object for the US?”), they are allies. Taiwan’s

concerns are shared via Acts and promises. In the IOR, China indeed has stretched lines, but it is addressing these in naval terms and its “Five Ps” may become stronger with time.

In national strategic terms, India’s continental challenges will persist and may drive military-strategic options and escalatory/ de-escalatory dynamics. Second, while China has vulnerabilities along its SLOCs (sea lines of communication), dominating these in conflict or in high tension is a slow, resource-intensive but a necessary process for India. This could be true even for the PLA against Indian SLOCs in the IOR. On the other hand, in the China Seas, the PLA-N and their multitudinous maritime militia could impact our considerable trade very quickly unless the Indian Navy develops countermeasures to be deployed in the western Pacific. The expectation that coalition partners may do it for us seems currently far-fetched. For its ‘Five Ps’, China may well leverage another ‘P’: Pakistan. No matter how we look at it, India presently has no partner, friend or ally anywhere close to what China and Pakistan are to each other. In the IOR, even with China alone, we may have a multi-front maritime theatre. With both nations as likely adversaries, we will face multiple land, sea and air fronts. Apart from Pakistan, China seems to be seeking more friends, and places and bases that could help it at least in the initial stages in a conflict of choice. Politico-diplomatically, it may try and get away with missile and aircraft overflight routing for its belligerent forces. There’s every likelihood that it will bring to bear all its five dimensions against India with Pakistan as its active or sleeping partner to boot. With bases, places, friends and space-based surveillance, persistence and precision could erode the current benefits of position, internal operational lines and maritime geography for India.

<https://www.indiatoday.in/magazine/defence/story/20210621-many-headed-dragon-in-the-indo-pacific-rear-admiral-sudarshan-shrikhande-reid-1813377-2021-06-11>

THE TIMES OF INDIA

Sat, 12 June 2021

Top Indian Army brass to discuss LAC situation at high-level meeting next week

New Delhi: Amid heightened military activities by the Chinese military opposite eastern Ladakh on its side on the Line of Actual Control, top Indian Army leadership would be briefed about the force's operational preparedness at a high-level meeting to be held here next week.

"The preparedness of the Indian Army to deal with any situation would be discussed at the meeting to be attended by all commander-in-Chief rank officers," a source told ANI.

The sources said that the meeting is scheduled to be held from June 16 for two days where other security issues faced by the country would also come up for discussion.

Army chief General Manoj Mukund Naravane has been monitoring the preparedness of the force all along the LAC and has personally visited the Ladakh sector seven-eight times to take stock of the situation there.

The Chinese military is holding large-scale military exercises in its traditional training areas including the locations from where they had diverted towards the Indian front in an aggressive manner last summer.

The Indian Army is hopeful of resolving the issue soon as they have been holding talks with the Chinese military. The military and diplomatic parleys have helped in the withdrawal of troops from the Pangong lake area but the stalemate in the other friction points still continues.

India and China have been engaged in a military standoff for more than a year now after the Chinese showed aggression along the Indian areas. The Indian side retaliated heavily and deployed more than 50,000 troops and heavy weaponry to check the Chinese aggression.

<https://timesofindia.indiatimes.com/india/top-indian-army-brass-to-discuss-lac-situation-at-high-level-meeting-next-week/articleshow/83434297.cms>



Sat, 12 June 2021

Researchers build first modular quantum brain sensor, record signal

A team of scientists at the University of Sussex have for the first time built a modular quantum brain scanner, and used it to record a brain signal. This is the first time a brain signal has been detected using a modular quantum brain sensor anywhere in the world. It's a major milestone for all researchers working on quantum brain imaging technology because modular sensors can be scaled up, like Lego bricks. The team have also connected two sensors like Lego bricks, proving that whole-brain scanning using this method is within reach—as detailed in their paper, which is published today in pre-print. This has not been possible with the currently commercially available quantum brain sensors from the United States.

These modular devices work like play bricks in that they can be connected together. This opens up the potential for whole-brain scanning using quantum technology, and potential advances for neurodegenerative diseases like Alzheimer's.

The device, which was built at the Quantum Systems and Devices laboratory at the university, uses ultra-sensitive quantum sensors to pick up these tiniest of magnetic fields to see inside the brain in order to map the neural activity.

The team applied the sensors to outside of a participant's scalp, close to the visual cortex of the brain. They asked the participant to open and close their eyes at 10–20 second intervals, and were able to detect a signal. This is a very simple action, but to see it happening inside the brain—from the outside—requires hugely sophisticated quantum technology.

Thomas Coussens Ph.D. student at the University of Sussex, who built the sensor, explained:

"Our quantum sensor has to be exceptionally sensitive to pick up the magnetic fields in the brain which are very weak indeed. To put it into context, the magnetic field of a brain is a trillion times lower than that of a fridge magnet.

"Because our device is so-far unique in that it is modular—and we've shown the modularity works by connecting two sensors together—we now plan to scale up this project by building more sensors to turn this into an entire brain imaging system. This could provide significant advancements in detecting and delivering treatment for neurodegenerative diseases such as Alzheimer's.

"This is the culmination of many months of hard work and I am thrilled to see our first brain signal using our very own quantum sensors built entirely by us here at the University of Sussex."

Professor Peter Krüger, Experimental Physicist and Director of the Sussex Programme for Quantum Research at the University of Sussex explained:

"As our sensor works on a modular basis, we will now be able to scale it up to create much more detailed images of the brain or parts of the brain. You can't do that with the current commercial



Credit: Pixabay/CC0 Public Domain

product available. This new sensor built at the University of Sussex opens the door for UK-produced quantum sensors, hugely important in the wider UK quantum technology landscape.

"To have this sensor is a major step to further interdisciplinary studies involving researchers ranging from consciousness scientists and engineers to neuroscientists which is very much in the spirit of how we tackle research here at Sussex." Professor Kai Bongs, Principal Investigator at the UK Quantum Technology Hub Sensors and Timing, said:

"We are delighted with this ground-breaking development by Hub researchers at the University of Sussex. These successes are helping considerably to advance the UK quantum ecosystem, bringing us a step closer to exploiting quantum sensor technology in clinical applications that will have real societal impact. Building a strong quantum brain imaging capability in the UK is a great example of our collaboration."

The quantum magnetic sensor uses an optically pumped magnetometer inside a magnetic shield to reduce environmental magnetic fields and ensure they are not being detected. In simple terms, the sensor works by putting a vapor into a quantum state, shining a laser beam through it and using a photo detector to see how much light has gone through. How the atomic vapor interacts with the laser light very sensitively depends on the magnetic field. The tiny electric currents in the neurons in the brain lead to very small magnetic fields even outside the brain which is what the sensor picks up.

More information: Modular optically-pumped magnetometer system. [arXiv:2106.05877v1](https://arxiv.org/abs/2106.05877) [physics.atom-ph]
<https://phys.org/news/2021-06-modular-quantum-brain-sensor.html>



Sat, 12 June 2021

Researchers observe sound-light pulses in 2D materials for the first time

Using an ultrafast transmission electron microscope, researchers from the Technion—Israel Institute of Technology have, for the first time, recorded the propagation of combined sound and light waves in atomically thin materials.

The experiments were performed in the Robert and Ruth Magid Electron Beam Quantum Dynamics Laboratory headed by Professor Ido Kaminer, of the Andrew and Erna Viterbi Faculty of Electrical & Computer Engineering and the Solid State Institute.

Single-layer materials, alternatively known as 2D materials, are in themselves novel materials, solids consisting of a single layer of atoms. Graphene, the first 2D material discovered, was isolated for the first time in 2004, an achievement that garnered the 2010 Nobel Prize. Now, for the first time, Technion scientists show how pulses of light move inside these materials. Their findings, "Spatiotemporal Imaging of 2D Polariton Wavepacket Dynamics Using Free Electrons," were published in *Science*.

Light moves through space at 300,000 km/s. Moving through water or through glass, it slows down by a fraction. But when moving through certain few-layers solids, light slows down almost a thousand-fold. This occurs because the light makes the atoms of these special materials vibrate to



Credit: CC0 Public Domain

create sound waves (also called phonons), and these atomic sound waves create light when they vibrate. Thus, the pulse is actually a tightly bound combination of sound and light, called "phonon-polariton." Lit up, the material "sings."

The scientists shone pulses of light along the edge of a 2D material, producing in the material the hybrid sound-light waves. Not only were they able to record these waves, but they also found the pulses can spontaneously speed up and slow down. Surprisingly, the waves even split into two separate pulses, moving at different speeds.

The experiment was conducted using an ultrafast transmission electron microscope (UTEM). Contrary to optical microscopes and scanning electron microscopes, here particles pass through the sample and then are received by a detector. This process allowed the researchers to track the sound-light wave in unprecedented resolution, both in space and in time. The time resolution is 50 femtosecond—50X10⁻¹⁵ seconds—the number of frames per second is similar to the number of seconds in a million years.

"The hybrid wave moves inside the material, so you cannot observe it using a regular optical microscope," Kurman explained. "Most measurements of light in 2D materials are based on microscopy techniques that use needle-like objects that scan over the surface point-by-point, but every such needle-contact disturb the movement of the wave we try to image. In contrast, our new technique can image the motion of light without disturbing it. Our results could not have been achieved using existing methods. So, in addition to our scientific findings, we present a previously unseen measurement technique that will be relevant to many more scientific discoveries."

This study was born in the height of the COVID-19 epidemic. In the months of lockdown, with the universities closed, Yaniv Kurman, a graduate student in Prof. Kaminer's lab, sat at home and made the mathematical calculations predicting how light pulses should behave in 2D materials and how they could be measured. Meanwhile, Raphael Dahan, another student in the same lab, realized how to focus infrared pulses into the group's electron microscope and made the necessary upgrades to accomplish that. Once the lockdown was over, the group was able to prove Kurman's theory, and even reveal additional phenomena that they had not expected.

While this is a fundamental science study, the scientists expect it to have multiple research and industry applications. "We can use the system to study different physical phenomena that are not otherwise accessible," said Prof. Kaminer. "We are planning experiments that will measure vortices of light, experiments in chaos theory, and simulations of phenomena that occur near black holes. Moreover, our findings may permit the production of atomically thin fiber optic "cables," which could be placed within electrical circuits and transmit data without overheating the system—a task that is currently facing considerable challenges due to circuit minimization."

The team's work initiates the research of light pulses inside a novel set of materials, broadens the capabilities of electron microscopes, and promotes the possibility of optical communication through atomically thin layers.

"I was thrilled by these findings," said Professor Harald Giessen, from the University of Stuttgart, who was not a part of this research. "This presents a real breakthrough in ultrafast nano-optics, and represents state of the art and the leading edge of the scientific frontier. The observation in real space and in real time is beautiful and has, to my knowledge, not been demonstrated before."

Another prominent scientist not involved with the study, John Joannopoulos from the Massachusetts Institute of Technology, added that, "The key in this accomplishment is in the clever design and development of an experimental system. This work by Ido Kaminer and his group and colleagues is a critical step forward. It is of great interest both scientifically and technologically, and is of critical importance to the field."

More information: Yaniv Kurman et al, Spatiotemporal imaging of 2D polariton wave packet dynamics using free electrons, *Science* (2021). DOI: [10.1126/science.abg9015](https://doi.org/10.1126/science.abg9015)

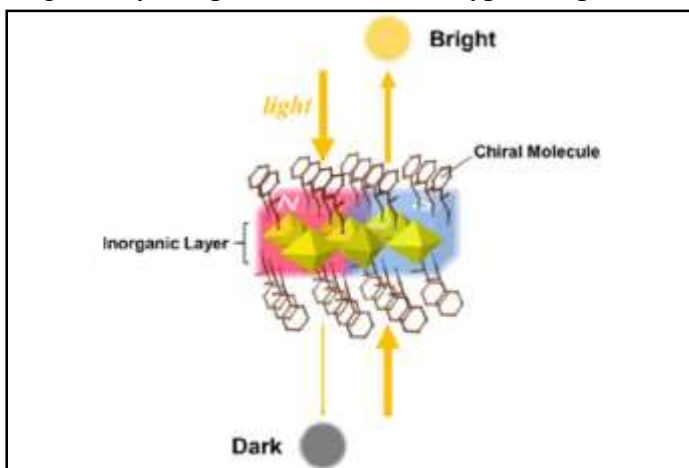
Journal information: [Science](https://phys.org/news/2021-06-sound-light-pulses-2d-materials.html)
<https://phys.org/news/2021-06-sound-light-pulses-2d-materials.html>

Novel magnet design with mirror-like properties

Researchers at Tohoku University have demonstrated the designability of novel magnets with magic mirror-like characteristics in organic-inorganic hybrid perovskite (OIHP)-type compounds.

OIHP-type compounds, a type of material used to construct solar cells, possess exceptional optical properties and have recently attracted worldwide interest. Researchers are keen to harness their structural diversity.

Although the superior optical properties of OIHPs have been mainly studied for their photoelectric characteristics, several OIHP-type compounds are known to function as magnets that transmit light. Combining the excellent optical characteristics with magnetism, OIHP-type compounds are a promising platform for designing functional magneto-optical materials.



A multi-institutional Japanese team, led by Kouji Taniguchi of Tohoku University's Institute for Materials Research, developed a new magnet, in which brightness changes are determined by whether the material is viewed from the front or the back.

Taking advantage of OIHP-type compounds, they have designed low symmetry magnets, where magic mirror characteristics are expected, by introducing chiral organic molecules into layered crystal structure of inorganic magnets.

In addition, they found that the front and back of matter can be switched by a low magnetic field, which is obtainable by a ubiquitous permanent magnet.

"We hope the development of new magneto-optical materials based on the material design concept presented in this study will lead to the applications in spin photonic devices," said Taniguchi.

More information: Kouji Taniguchi et al, Magneto-Electric Directional Anisotropy in Polar Soft Ferromagnets of Two-Dimensional Organic-Inorganic Hybrid Perovskites, *Angewandte Chemie International Edition* (2021). DOI: [10.1002/anie.202103121](https://doi.org/10.1002/anie.202103121)

Journal information: *Angewandte Chemie International Edition*
<https://phys.org/news/2021-06-magnet-mirror-like-properties.html>



Sat, 12 June 2021

New research shows COVID-19 can possibly lead to diabetes

By Kyndell Kim

Las Vegas (KSNV) — New research shows COVID-19 could be causing diabetes.

"Diabetes can lead to cardiovascular disease, to stroke. Diabetes is the number one cause of blindness in the country. Diabetes is the number one cause of renal failure," cautioned Roseman University College of Medicine dean Dr. Pedro Joe Greer, Jr., MD.

Dr. Greer trained in Internal Medicine, completing post-doctoral fellowships in Hepatology and Gastroenterology.

From respiratory issues to fevers and coughs, doctors are now adding to the list of medical issues tied to COVID-19. Researchers are ringing the alarm of a link between the SARS-CoV-2 virus and Type 1 diabetes.

"Even the long-term consequences of COVID, we're seeing some now, but we don't know what they're going to be," explained Dr. Greer.

Researchers studied the bodies of those who died from COVID-19. Nevada doctors explained the worrying findings showed the virus can attack certain cells in the pancreas needed to protect against diabetes.

"It is related to the cells of the pancreas where they stop making insulin, called the beta cells, so it really presents pretty quickly over about a week or two of symptoms," explained Dr. Amber Champion, endocrinologist and Assistant Professor of Medicine at the Kirk Kerkorian School of Medicine at UNLV.

Type 1 diabetes symptoms include increased thirst, frequent urination, unintended weight loss, fatigue and blurred vision.

"I would caution people who have had the virus infection in the past that they need to be monitored for those symptoms and if they develop them, please go in and get checked out," said Dr. Champion.

The CDC states that 34.2 million people (10.5% of the U.S. population) have diabetes, with 7.3 million remaining undiagnosed.

With the potential now for an added cause, doctors are pressing for you to take note.

"The only one that can deal with that is either your physician, or if your primary care provider is a nurse practitioner," said Dr. Greer.

<https://news3lv.com/news/local/new-research-shows-covid-19-can-possibly-lead-to-diabetes>

